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. . . shedding stones safely with

PRELUDIN*

brand of 2-phenyl-3-methyl-tetrahydro-1, 4-oxazine-hydrochloride

the appetite controlling agent that makes dieting easier

INGELHEIM

Manufactured and Distributed in England by Pfizer Ltd., Folkestone, Kent, for
C. H. Boehringer Sohn, Ingelheim am Rhein
Registered proprietors of the Trade Mark.

**Regd. Trade Mark*

Relief of Rheumatic Pain in General Practice

1. *Formulation of succinate overcomes toxicity of massive dosage of aspirin*

Pain caused by all forms of rheumatism can now be relieved promptly by massive aspirin dosage *without fear of toxicity*. The Berex formulation of aspirin (3.7 gr.) and calcium succinate (2.8 gr.) has overcome this old problem so effectively that your patients can safely administer the drug themselves. Repeated visits to the surgery for supervision of administration are unnecessary.

2. *Side-effects fewer and milder*

Even after prolonged dosage, Berex produces no toxic effects. The prothrombin level is maintained and there is no hæmorrhagic tendency.* Prolonged periods of relief can be enjoyed in safety. The patient is simply instructed to reduce the initial high dosage as soon as the pain diminishes. Side effects, if present at all, are fewer and milder.

3. *Encourages tissue respiration*

Experimentally, by Warburg test, it has been shown that the inhibitory action of salicylate on tissue respiration is completely offset when it is combined with succinate. Succinate encourages cellular respiration and stimulates the respiratory enzyme systems. It is to this stimulating action that the beneficial effect of succinate is attributed.

* "*No abnormal prolongation of prothrombin time even after 68 days of succinate-salicylate.*" "*The results also show that this succinate-salicylate formulation combines safety and efficacy, permitting wide use both for treatment and maintenance without the excessive supervision required in many other forms of therapy.*"
Delaware State Med. J., 1954, 26, 22.

BEREX
Trade Mark

PROMPT RELIEF of all rheumatic pains by massive aspirin dosage is now made safe by the Berex succinate-aspirin formulation. Prolonged dosage does not lower the prothrombin level, and does not therefore produce hæmorrhagic tendency.

FOR PROMPT RELIEF OF PAIN ASSOCIATED WITH ALL FORMS OF RHEUMATISM

FORMULA:
Calcium succinate 2.8 gr., acetylsalicylic acid 3.7 gr.
IN TABLET FORM:
basic N.H.S. price, 4/8½d.–100 tablets; 24/3d.–600 tablets.

BEREX HAS NEVER BEEN ADVERTISED TO THE PUBLIC

A professional sample will be sent on request to:
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THE IMPROVED TRANQUILLIZING DRUG WITH FEWER SIDE-EFFECTS

9-(1-methyl-3-piperidylmethyl) phenothiazine.

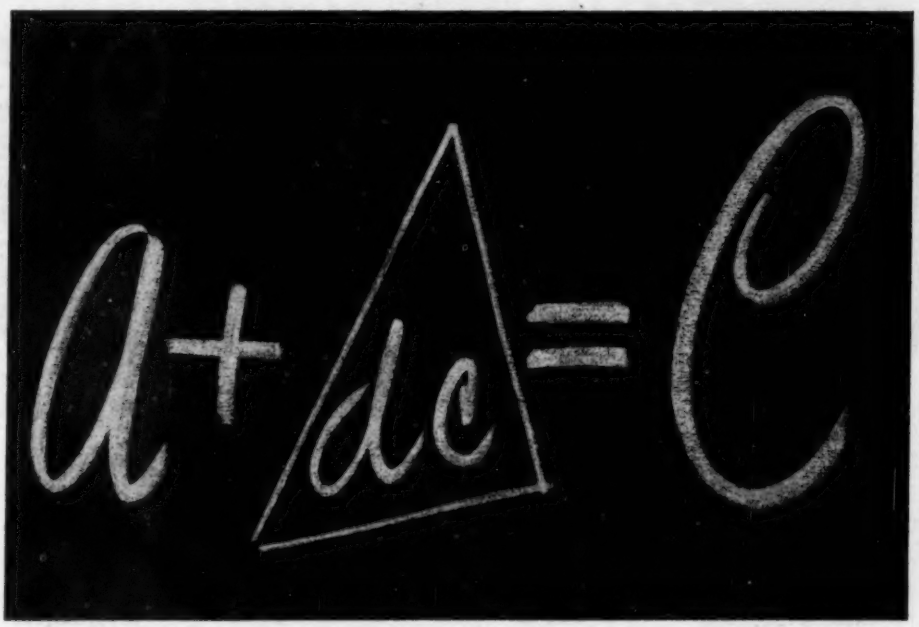
Clinical trials in many countries have proved PACATAL to be highly effective in mental disturbances ranging from the psychoneuroses to the psychoses . . . PACATAL reduces tension, makes the patient quieter, less confused—but still alert, objective, co-operative, amenable to psychotherapy.

PACATAL
is available in tablets for oral administration and ampoules for parenteral use.
Tablets 25 mg. in bottles of 50 and 500. Ampoules, each containing 50 mg. in 2 ml. in boxes of 10 and 50.

PACATAL
can be administered with complete confidence for it is of very low toxicity and uniquely free from such troublesome side-effects as skin rashes, jaundice, Parkinson symptoms, orthostatic collapse and tachycardia.

WILLIAM R. WARNER & CO. LTD., POWER RD., LONDON, W.4.

PAC 325/1



for

additive anti-inflammatory effects

decreased side-effects

In rheumatic disease Aspirin + Delta-Cortef (PREDNISOLONE) = **Cordex***

Cordex combines Delta-Cortef and acetylsalicylic acid to provide the additive *anti-inflammatory* activity of each drug, plus the *analgesic* action of the salicylate.

With this combination relief of pain is normally afforded in 24 to 72 hours. In the amount employed, Cordex achieves an effect equal to that produced by 2 or more times the amount of adrenal steroid alone. This combination permits a reduction in the dosage of each component, which results in a decrease in undesired side reactions.

Indicated in: fibrositis, tendinitis, synovitis, myositis, bursitis, neuritis, lumbago, painful shoulder, non-articular rheumatism, allergic arthritis, osteoarthritis and mild or low-grade rheumatoid arthritis.

Each CORDEX tablet contains:

Delta-1-hydrocortisone (Prednisolone) .....0.5 mg.

Acetylsalicylic acid .....300.0 mg.

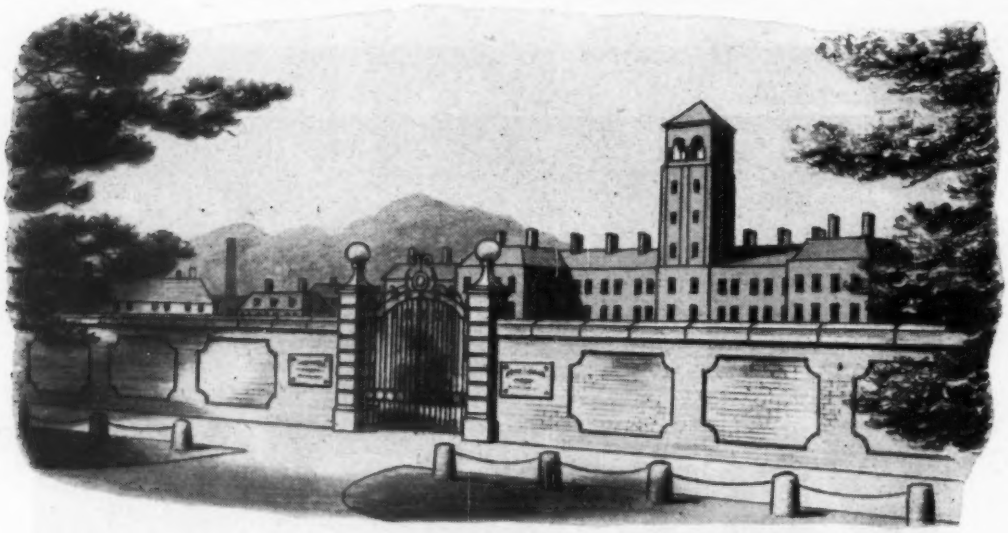
Average dosage 1-2 tablets four times a day.

Bottles of 100 tablets

***CORDEX** is at present available to hospitals only.* *Trade mark

Upjohn

UPJOHN OF ENGLAND LTD., 4 Aldford Street, Park Lane, London, W.1



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*TRADE MARK

MEPROBAMATE

promises much in mental illness

The virtues of MILTOWN as a powerful yet safe tranquillizer in the psychoneuroses are already widely recognised. Preliminary experience with the drug in psychotic patients now indicates that it may play an important part in the treatment of mental disease. In a dosage higher than that used for the psychoneuroses, MILTOWN may benefit delusional, assaultive, noisy and hallucinated patients, restoring well-being, calmness and serenity. Some manic-depressives and hypomaniacs have also been favourably affected by the drug.

MILTOWN has been used successfully as a premedication in E.C.T. and as a valuable aid in psychotherapy. It has not been reported to elicit suicidal tendencies. The low incidence of side effects and a low toxicity are notable features in therapy with MILTOWN. The drug has been given over long periods to psychotic patients without ill effects.

MILTOWN ***is the one tranquillizer that relaxes both mind and body***

MILTOWN Meprobamate is 2-methyl-2-n-propyl-1, 3-propanediol dicarbamate.

Bottles of 50 and 500. 400 mg. tablets

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FERROMYN *(Ferrous Succinate)* has been proved clinically to offer a most acceptable form of iron for oral administration in the treatment of hypochromic anæmias.

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In a clinical trial* conducted this year a therapeutic comparison was made between Oral (*Ferromyn*), Intramuscular and Intravenous methods of iron administration. **"... and unless the patient is very near term this *(Ferromyn)* is the method of choice in the first instance, even for severe degrees of iron-deficiency anæmia."**

* *British Medical Journal (1956)*, **2**, *638*

FERROMYN *is presented in four forms:*

FERROMYN TABLETS & FERROMYN ELIXIR Each tablet/teaspoonful contains: *Ferrous Succinate 150 mg.*

FERROMYN 'B' TABLETS & ELIXIR FERROMYN 'B' Each tablet/teaspoonful contains: *Ferrous Succinate 150 mg. Aneurine Hydrochloride 1 mg. Riboflavin 1 mg. Nicotinamide 10 mg.*

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liquid vitamin supplement

Children take Paladac without fuss or bother because it "tastes good".

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Doctors can prescribe Paladac with confidence since it provides a reliable daily source of vitamins—one 4 c.c. teaspoonful supplies 7 vitamins in amounts exceeding minimum daily vitamin requirements.

Primarily intended for the 3-10 age-group, Paladac is equally suitable for adolescents and adults where liquid medication may be preferred.

Paladac is supplied in bottles of 4 and 16 fl. ozs.

Each teaspoonful (4 c.c.) contains:— Vitamin A 5,000 units, Vitamin D 1,000 units, Vitamin B_1 (Aneurine Hydrochloride) 3 mg., Vitamin B_2 (Riboflavin) 3 mg., Vitamin B_6 (Pyridoxine Hydrochloride) 1 mg., Nicotinamide 20 mg., Vitamin C (Ascorbic Acid) 50 mg.

Parke, Davis & COMPANY, LTD. *(Inc. U.S.A.) Hounslow, Middlesex. Tel: Hounslow 2361* 700

Milk-alkali drip therapy without a tube

NULACIN

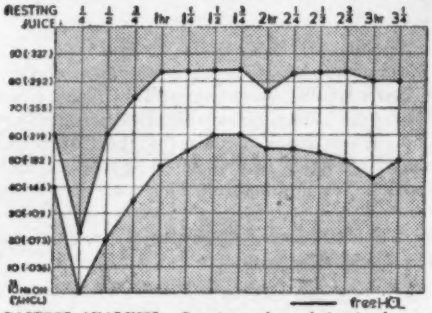
A most effective control of gastric acidity is milk-alkali drip therapy; the most convenient way of obtaining milk-alkali drip therapy is by sucking Nulacin tablets.

Thus, Nulacin is of great value in the treatment of peptic ulcer in the ambulatory patient, and in the prevention of ulcer relapse.

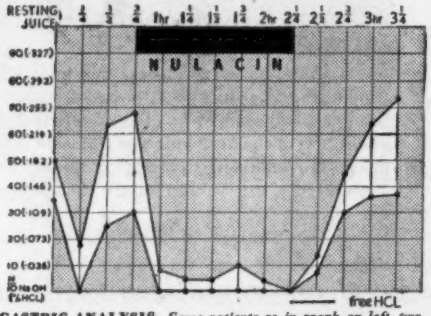
Nulacin tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium trisilicate 3.5 grs; Magnesium oxide 2.0 grs; Calcium carbonate 2.0 grs; Magnesium carbonate 0.5 grs; Ol. menth. pip. q.s. Their shape, size and consistency are such that, when they are allowed to dissolve slowly in the mouth control of gastric acidity can be achieved. Up to three tablets an hour may be required to give continuous neutralization of the gastric contents.

Nulacin tablets are not advertised to the public, have no B.P. equivalent, and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to Pharmacists is 2/-.) Also available in tubes of 12.

Nulacin is available throughout the British Commonwealth, in the U.S.A. and in many other countries. It is known as Nulactin in Canada and Sweden.



GASTRIC ANALYSIS. *Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.*



GASTRIC ANALYSIS. *Same patients as in graph on left, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.*

BIBLIOGRAPHY:

The Control of Gastric Acidity. *Brit. Med. J.* 26th July, 1952, 2: 180-182. Medical Treatment of Peptic Ulcer. *Med Press* 27th February, 1952, 227: 195-199. Notes on Remedial Agents. *Med Rev.* September, 1952, 46: 162. Discussion on Peptic Ulceration. *Proc. Roy. Soc. Med.* May 1953, 46: 354. The Effect on Gastric Acidity of "Nulacin" tablets. *Med. J. Aust.* 28th November, 1953, 2: 823-824. Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. Clin. Med.* 1953, 42: 955. Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.* 23rd January, 1954, 1: 183-184. Clinical Investigation into the Action of Antacids. *The Practitioner* July, 1954, 173: 46. Management of Peptic Ulceration in General Practice. *Med. World* December, 1954, 81: 591-601. Ambulatory continuous Drip Method in the Treatment of Peptic Ulcer. *Amer. J. Dig. Dis.* March, 1955, 22: 67-71. Notes on Remedial Agents. *Med. Rev.* October, 1955, 49: 142. Antacids in Peptic Ulcer. *The Practitioner*, January, 1956, 176: 103.

Samples available on request

HORLICKS LIMITED

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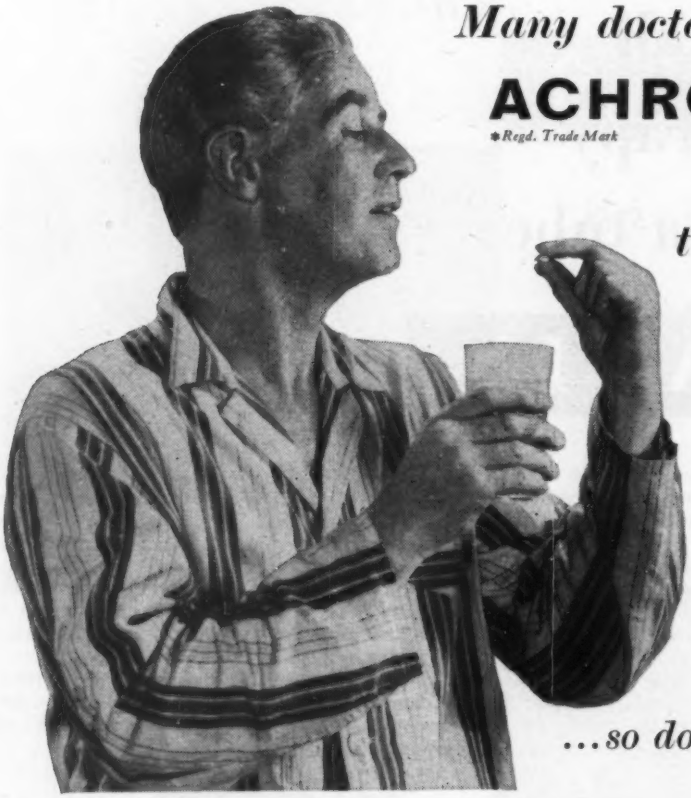

Many doctors prefer

ACHROMYCIN*

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Tetracycline

in

tablet form...

...so do many patients

ACHROMYCIN tetracycline is now established as the foremost broad-spectrum antibiotic of the day. Among the 14 prescription forms of ACHROMYCIN now available, ACHROMYCIN Tablets are especially favoured by practitioners. The odourless thin coating of the Tablets quickly dissolves, permitting ready absorption of the antibiotic and diffusion into body fluids and tissues. Patients find the Tablets are easy to swallow and a particularly convenient form of the antibiotic. Like all other prescription forms of ACHROMYCIN, the Tablets ensure broad-spectrum activity, prompt control of infection with negligible side effects.

50 mg. Tablets—vials of 25 and 100. 250 mg. Tablets—vials of 16, bottles of 100 and 1,000

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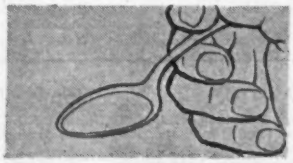
ACHROMYCIN Liquid Pediatric Drops—Palatable cherry-flavoured preparation for administration in milk, water or fruit juice. *1 Gm. in 10 cc. bottle.*



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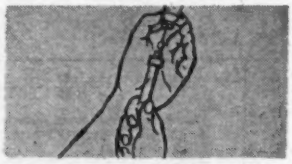

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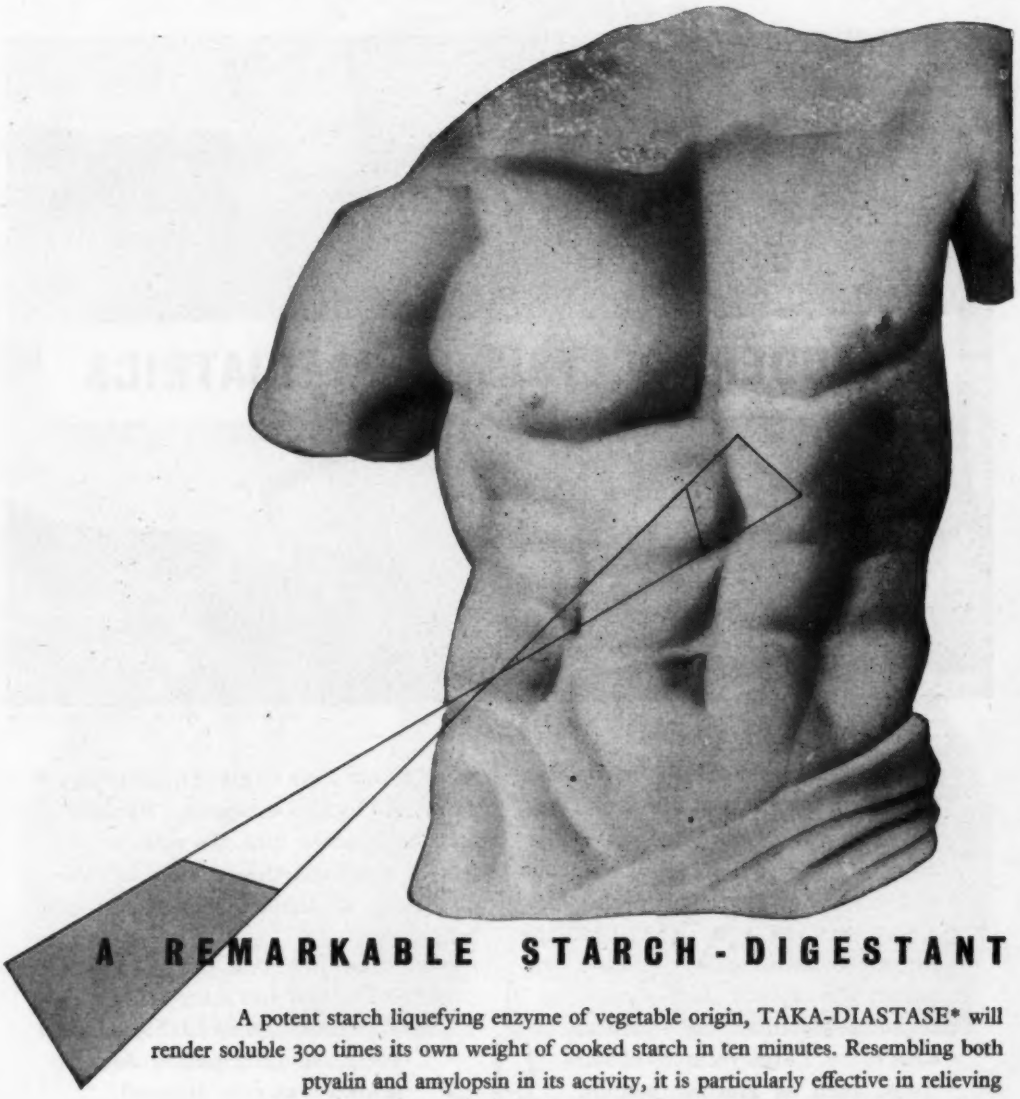

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A potent starch liquefying enzyme of vegetable origin, TAKA-DIASTASE* will render soluble 300 times its own weight of cooked starch in ten minutes. Resembling both ptyalin and amylopsin in its activity, it is particularly effective in relieving amylaceous dyspepsia, gastric discomfort, and as an aid to nutrition.

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TAKA-DIASTASE SEDATIVE ELIXIR *(No. 198)*
A combination of Taka-Diastase, bismuth and nux vomica for dyspepsia accompanied by nausea or pain.

TAKAZYMA
Taka-Diastase, with insoluble carbonates. Gives 3-fold relief of (1) hyperacidity (2) undigested starch (3) irritation of gastric mucosa.
Powder in jars of 2 ozs. and tins of 1 lb.
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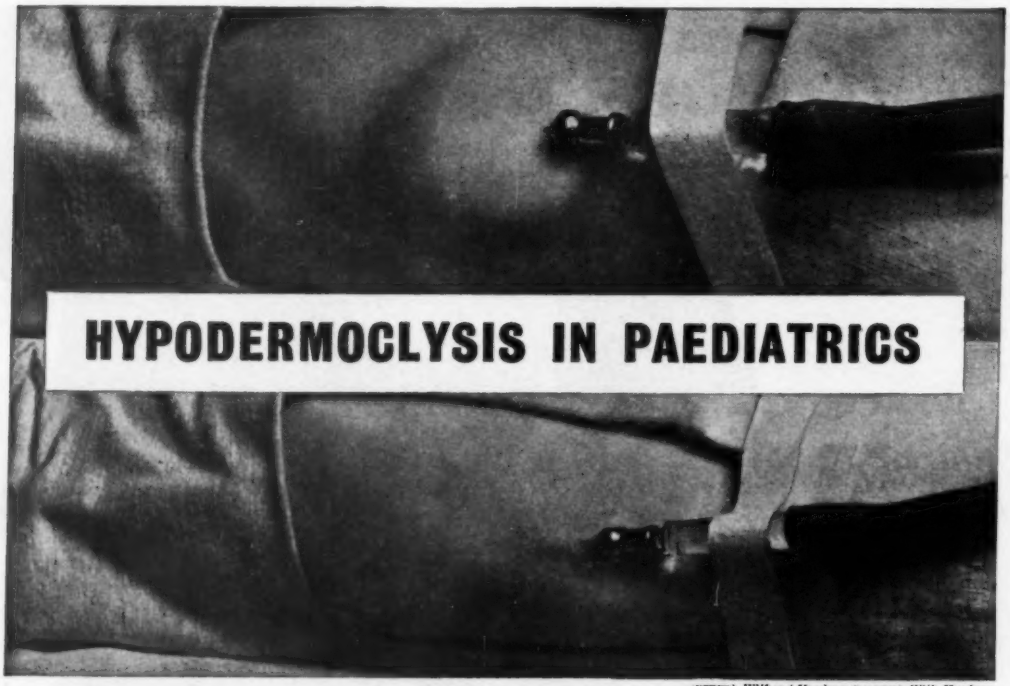

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(UPPER) *Without Hyalase* (LOWER) *With Hyalase*

INTRAVENOUS THERAPY may often be difficult owing to the inaccessibility of suitable veins or the restlessness of the child. Subcutaneous administration must be undertaken.

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'Saridone' tablets are issued in packings of 10, 50 and 250

Each tablet contains:

Phenyl-dimethyl-isopropyl-pyrazolon ...	0.15 g.
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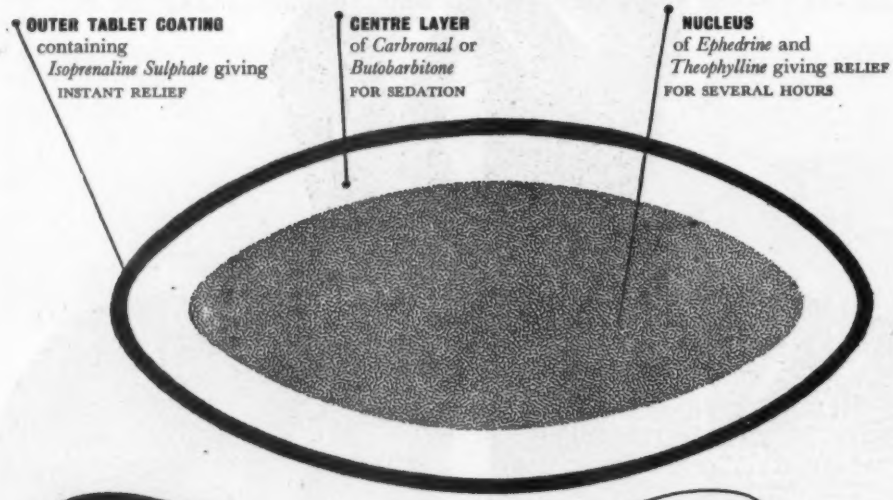
PROVIDED BY RELAY ACTION IN A SINGLE TABLET



BY NIGHT

FYDAL

FYDAL TABLETS, containing Butobarbitone, are intended for night use and should be taken when premonitory symptoms of an attack appear.

Formula: Ephed. Hydrochlor., B.P. 32 mg.
Theophyll., B.P. 64 mg.
Isoprenal. Sulph., B.P. 10 mg.
Butobarbitone, B.P.C. 48 mg.

Basic N.H.S. price . . . . foil-pack of 10 tablets . . . 1/8d.

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FYDALEX

FYDALEX TABLETS, contain Carbromal in place of Butobarbitone and are for use during the day. Like FYDAL, they provide immediate and prolonged relief.

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Used conjointly, FYDAL and FYDALEX provide an effective round-the-clock treatment and may be prescribed accordingly.

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INTESTINAL PAIN
RELIEVED
WITHOUT
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'Merbentyl' is free from the unpleasant side-effects (drying of the mouth, blurred vision, etc.) normally encountered with both natural and synthetic anticholinergic agents. Its specific action on the gastro-intestinal tract makes it the spasmolytic of choice for the relief of pain in peptic ulcer and similar organic conditions. In addition, it is outstandingly successful for NERVOUS DYSPEPSIA.

'MERBENTYL' tablets are economical — basic daily cost to the N.H.S. is no more than 7d.

MERBENTYL REGD.

In tablets and as a syrup, each tablet or 5 c.c. syrup containing 10 mg. diethylaminocarbethoxybicyclohexyl hydrochloride.

MERBENTYL
with **Phenobarbitone**

in tablets and as a syrup, each tablet or 5 c.c. syrup containing 10 mg. 'Merbentyl' and 15 mg. (gr. ¼) phenobarbitone.

For conditions requiring sedation in addition to antispasmodic therapy.

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'MERBENTYL' and 'MERBENTYL' WITH PHENOBARBITONE *are distributed in the United Kingdom and Eire by*

RIKER LABORATORIES LIMITED · LOUGHBOROUGH · LEICS.

for the Wm. S. Merrell Company, London

For infections of the mouth and throat and for the relief of sore throat and laryngitis

'HIBITANE'

antiseptic lozenges

Containing the new I.C.I. antiseptic 'Hibitane' (Chlorhexidine)
Formula: 'Hibitane' Dihydrochloride 5 mg. Benzocaine B.P. 2 mg.

ADVANTAGES

1 Powerful antibacterial effect against Gram-positive and Gram-negative organisms. Also active against Monilia and Aspergillus.

2 The saliva produced when sucking a lozenge is highly bactericidal to mouth pathogens. Saliva tests show 'Hibitane' lozenges to be far superior to other antiseptic lozenges.

3 Low oral toxicity; harmless to the tissues locally.

4 No sensitivity reactions, local or general, have been reported with 'Hibitane'.

5 Bacteria do not develop resistance to 'Hibitane', nor can resistance be induced *in vitro*.

6 The lozenges are pleasantly flavoured and well liked by children.

HIBITANE

'Hibitane' Lozenges are issued in tubes of 12. Basic N.H.S. cost: 1/5d. (plus purchase tax) for 12 lozenges.

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The secret of sleep...

in a capsule

Lilly **BARBITURATES**

'SECONAL' SODIUM'
Quick onset - short duration.
In 'Pulvules' ¾ gr. and 1½ grs.

'SODIUM AMYTAL'
Medium onset and duration.
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Quick onset - medium duration.
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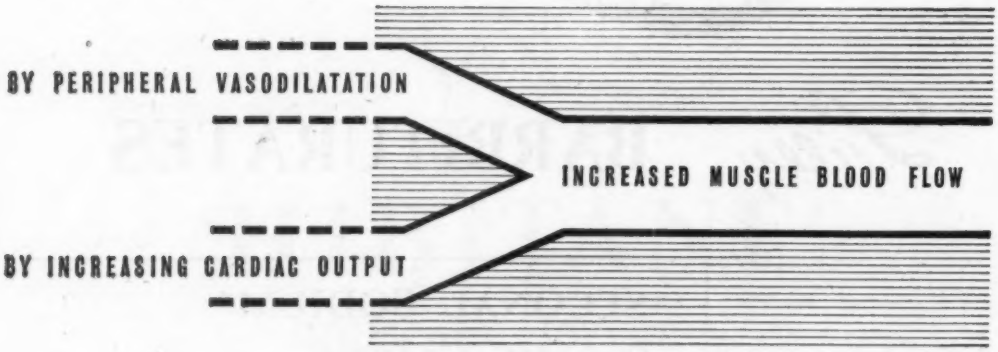
PERDILATAL*

TRADE MARK

increases muscle and skin blood flow in two ways



PERDILATAL has a two-fold action. It causes a dilatation of peripheral blood vessels, ensuring a preferential increase in muscle blood supply. At the same time the cardiac minute volume is increased; systolic pressure is maintained, diastolic pressure falls; mean arterial pressure is kept constant. This combination of vasodilatation and increased cardiac minute volume results in a considerable increase in muscle blood flow and a slight increase in cutaneous blood flow.

Indications : peripheral vascular disorders : intermittent claudication, arteriosclerosis; hypertension, rheumatic conditions.

Toxicity : low.

Dosage : Oral : 1 to 2 tablets, 4 to 6 times daily.
Parenteral : 1 to 3 ampoules daily may be administered.

Availability : tablets (2½ mg.) in containers of 100 and 500 ; ampoules (5 mg. in 1 ml.) in boxes of 12.

PERDILATAL was formerly known as DILATAL. *Full details from*

an S&N product

SMITH & NEPHEW LTD

WELWYN GARDEN CITY · HERTS

* 1-(p-hydroxyphenyl)-2-(l'methyl-3'-phenyl-propylamino)-propanol-(1) hydrochloride.

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Pro-Banthine* — The safe, potent anti-cholinergic agent for peptic ulcer.

Pro-Banthine* *with* **Phenobarbitone** — For peptic ulceration complicated by mental stress and anxiety.

Dramamine* — For nausea, vomiting and motion sickness.

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Metamucil* — The bland demulcent bulk corrective for promoting normal peristalsis and for the treatment of constipation.

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BENZEDREX INHALER

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Benzedrex Inhaler is effective 'Benzedrex' Inhaler provides initial relief from nasal congestion within seconds. Five minutes after inhalation shrinkage of the nasal mucosa is complete. Even with gross engorgement shrinkage remains adequate for over 1½ hours.

Benzedrex Inhaler is specific The active ingredient in 'Benzedrex' Inhaler is a new compound—propylhexedrine—that is remarkable for its highly specific vasoconstrictive action. Unlike amphetamine, propylhexedrine produces virtually no central nervous stimulation.

Benzedrex Inhaler is safe Because its vasoconstrictive action is uncomplicated by central nervous stimulation, 'Benzedrex' Inhaler may be freely used even by those patients in whom sympathomimetic drugs often cause insomnia, restlessness or nervousness. Even massive overdosage does not result in central nervous stimulation.

NEW AND BETTER... BENZEDREX INHALER

SKF's new and better volatile vasoconstrictor

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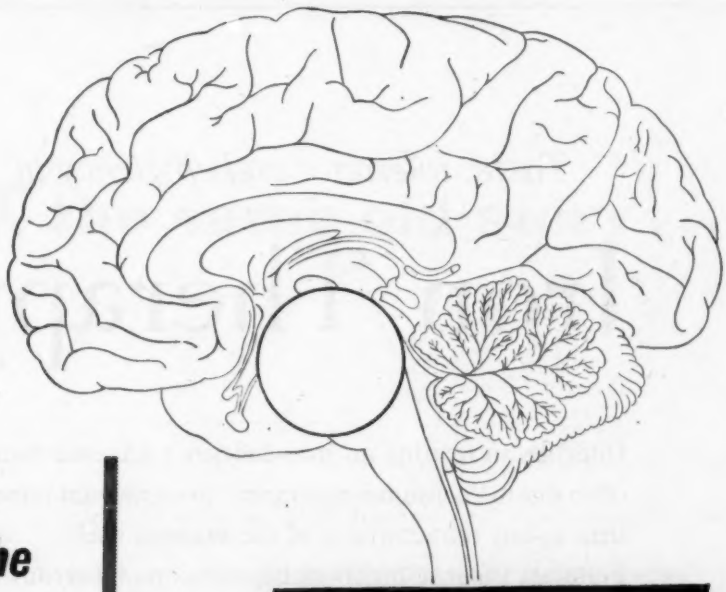

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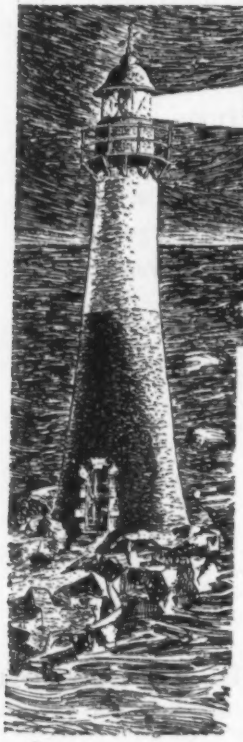

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PRACTICE, TEACHING, AND RESEARCH *

CRIGHTON BRAMWELL
M.A. Camb., M.D. Manc., F.R.C.P.
PROFESSOR EMERITUS OF THE UNIVERSITY OF MANCHESTER; CONSULTING PHYSICIAN, MANCHESTER ROYAL INFIRMARY

THE profession of medicine offers a wide choice of careers for men of different tastes. In recent years, ever-increasing opportunities have been provided for those whose interests lie in the borderland of physiology and medicine—what Sir Thomas Lewis (1933) called "Clinical Science." Lewis freely acknowledged the debt that clinical science owed in days gone by to the work of practising physicians and surgeons, and above all to William Harvey; but he felt that no man could serve two masters and, in his Harveian Oration (1933), after defining his conception of clinical science, he went on to say:

"This high status cannot be won for Clinical Science by the efforts of practising physicians and surgeons, however brilliant and unselfish their efforts may be; for these can be no more than occasional acts intermingled with very different activities, and the movement, to be successful, calls for concentrated purpose and sustained work over periods of many years."

Lewis, however, would have been the first to admit that one of the greatest clinical scientists of his own day was James Mackenzie—a busy and successful practitioner. Moreover the material on which Mackenzie's researches were based was drawn not from hospital but from private practice, and this is not surprising, for it is usual for clinicians who gain a reputation in a particular field to draw much, if not most, of their interesting material from that source.

Individual effort such as this always has had, and always will have, a place in clinical research. As Abraham Flexner (1925), one of the most ardent supporters of the full-time principle, said:

"The full-time scheme will not produce ability and enthusiasm where they do not exist, it will not make the sterile physician fertile, and meanwhile really determined and fertile minds will continue to produce on part-time or on almost no time at all."

In a man of Mackenzie's temperament, the urge to contribute to knowledge is overpowering. Nothing will stop him making time for research, no matter how wide his other commitments may be. That urge prevails, to a greater or lesser degree, in many Fellows of this College, and its implementation is a source of keen satisfaction to them. They would not presume to call themselves research-workers, for they recognise that they are not endowed with sufficient originality to justify devoting their whole lives to research; but, under the limitations imposed upon them, these humbler folk endeavour to the best of their ability to contribute to the advancement of knowledge. Have not they too earned the title of clinical scientists?

This more liberal definition of clinical science covers a wide spectrum, from those on the one hand who are able scientists but perhaps poor clinicians, to those on the other who are good clinicians and only faintly scientific. Between these two extremes lie the great majority of those I have in mind, for there is no sharp dividing-line between scientist and clinician, though very few can aspire to excellence in both fields.

Deductions drawn from careful and accurate observation at the bedside are no less scientific than those based on work with a microscope or a test-tube in the laboratory. The hospital ward is the laboratory of clinical medicine.

Lewis regarded the full-time clinical units established after the first world war as a step in the right direction; but he considered that they had failed to fulfil expectations, because so much time was devoted to teaching and administration. His own unit at University College approached more closely to his ideal, in that research took precedence over all other activities.

After the second world war came the great invasion which swept away the part-time professors in medicine, surgery, and other clinical subjects. Whether or no this was all to the good is a matter of opinion, but there can be no doubt that it did help to integrate the clinical and preclinical sciences and to provide a career for men of ability, like Lewis himself, who would otherwise probably have drifted into the preclinical departments and been lost to medicine. The clinical scientist of today bears a close resemblance to the physiologist of the past.

The pure clinical scientist is interested chiefly in the disease—the clinician in the patient. In two patients suffering from the same disease, the clinical scientist studies the features they have in common, but the clinician is no less concerned with the way they differ in their reaction to the disease. For him the soil is as important as the seed.

The Research Outlook

As teachers, we should try to cultivate in our students the spirit of curiosity, the desire to explore uncharted seas, the ambition to contribute to knowledge. This applies not only to those who later specialise, but also to those who become family doctors and, by reason of their calling, have opportunities denied to the consultant. At the same time, we must warn them that, when man is the experimental animal, scientific enthusiasm for the advancement of knowledge must never tempt them to do anything which might prove harmful to their patient. His welfare and happiness must always be their first consideration. Kindliness is a most important attribute in the clinician.

Sometimes, however, we are on the horns of a dilemma. If, in attempting to assess the value of some new drug or method of treatment, the physician himself is convinced that it is beneficial, is he justified in denying this remedy to some of his patients in order that they may serve as a control and so enable him to convince others of its value? Is he justified in asking even these few to make this sacrifice for the many? His scientific conscience would probably answer "Yes," but his clinical conscience "No."

The advance of physiology has tended to lead it away from medicine. From the medical point of view this is regrettable, for teachers in the preclinical years can help so much to establish continuity by showing their students how scientific principles can be applied to the investigation of clinical problems. In America, an attempt has been made to meet this situation by entrusting more of the teaching of physiology to clinicians.

Every subject in the medical curriculum should be closely linked with those that have gone before and those that follow after. Harvey himself clearly appreciated the importance of this, for in one of the notes at the beginning of his lectures, made for his own guidance (D'Arcy Power 1897), he defined his purpose as follows:

"To bring in points beyond mere anatomy in relation to the causes of diseases, and the general study of nature with the object of correcting mistakes and of elucidating the use and action of parts, for the use of anatomy to the physician is to explain what should be done in disease."

The divorce of physiology from medicine is largely responsible for the difficulties experienced by the student in passing from the preclinical to the clinical period of training. He arrives in hospital full of enthusiasm,

* From the Harveian Oration, delivered before the Royal College of Physicians of London on Oct. 18.

but is apt soon to experience a sense of frustration because he cannot see how to apply knowledge gained in the laboratory to work in the wards.

For the medical student, the study of physiology has a twofold purpose—educational and vocational. The latter we cannot afford to neglect; but I sometimes wonder whether the scientific attitude of mind could not be better cultivated in the preclinical years if physiology were taught more as a discipline and less as a subject; by that I mean selecting one system for intensive study (the system chosen depending on the particular interests of the professor) and dealing much less fully with the rest, in fact only in so far as they have direct bearing on clinical problems. Would not this give the student a better insight into the fundamental principles of scientific investigation—accuracy of observation and logical deduction? It is with the greatest diffidence that I put forward this suggestion, for I am not a physiologist.

In my own school, it is customary for a few of the best students in the physiology class to devote an extra year to that subject and take an honours B.Sc. degree. Their work during this period is comparable to the second part of the natural-sciences tripos at Cambridge. This gives them an insight to research and teaches them how to use a library; but, although it enables them to approach clinical work from a more scientific angle, I am inclined to think they would derive even greater benefit from such work when they are more mature and, as senior registrars, have gained some acquaintance with clinical problems.

A period of training devoted to research helps the young clinician to acquire the critical and logical approach to problems which will influence whatever work he later undertakes, while the association with a master mind is an inspiration to any young man. In my own limited experience there is nothing in my professional career to which I look back with greater satisfaction than having had the good fortune to work with three distinguished physiologists—Keith Lucas, A. V. Hill, and Joseph Erlanger, to each of whom I owe a deep debt of gratitude.

The growth of factual knowledge has made it impossible for the undergraduate of today to cover the syllabus as completely as did his predecessors, and, for that reason, it is all the more important that he should become an accurate observer and capable of drawing logical deductions from his observations, so that, when he encounters a problem new to him (and he will meet with many such in the course of his career), he will be able to deal with it rationally. It is not unreasonable to expect him to become fairly proficient in the ordinary methods of physical examination, and familiar with the limitations of the methods he employs; but one cannot expect him to have a wide factual knowledge.

As the committee of our College on medical teaching (1955) has pointed out, factual knowledge is in the long run less important than the ability to learn and to keep on learning. The student must try to learn thoroughly, in order to equip himself for his later work, not superficially in order to pass the next examination. In the past, vocational training has played too large a part in the medical curriculum. Now the introduction of a pre-registration year has made it possible to give the student a better basic professional education. Under present conditions, the bogy of examinations is the villain of the piece.

Here our American cousins have stolen a march on us. Dr. J. R. Ellis (Royal College of Physicians 1956) found that students in the schools he visited in the United States were virtually free from fear of examinations. In the clinical departments, their grading is based only partly on the result of tests given on the completion of each appointment, the assessment of the student and of his work during the appointment being made by all those who had taught him meeting in conference.

Clinical examinations play little part in America, as grading depends on the careful observation, throughout the clinical period of training, of the student's ability to handle patients, and it is felt that to "take" one more patient, under artificial conditions, would not add any valuable information. Personally, I doubt whether this view is correct, for I believe that the clinical examination does serve a useful purpose in that it gives the student an opportunity of showing his ability to deal with problems such as he will meet in practice. I feel sure, however, that we should follow the American example of giving the student more credit for good work in his various appointments, instead of letting his fate depend almost entirely on examinations. The bad examinee may make quite a good doctor.

Most examiners in medicine would, I think, agree that often the basic principles seem to have been swamped by the mass of factual detail the student has been required to memorise. Though he may have an amazing knowledge of complicated biochemical and other tests, when he comes to examine a patient his performance is apt to be disappointing, and failure in the higher examinations is often due to the candidate having been crammed instead of educated. He has not been taught to think and to observe. Undue attention to the acquisition of factual knowledge stifles originality.

One of Harvey's notes for his own guidance reads: "Not to enter into too much detail or into too minute a dissection, for time does not permit." How true that rings today. When he wrote that note, Harvey might well have had in mind the words of Hippocrates which are the motto of our College:

Ο βίος βραχὺς ἡ δὲ τέχνη μακρὴ

How well I remember translating that passage when I sat for the Membership examination. We no longer give candidates for the Membership credit for knowledge of the classics, but this is no sudden change of policy, for since 1865 we have disregarded Harvey's injunction that this Oration should be delivered in the Latin tongue.

The modern medical student does not expect his teachers to be omniscient, and, although a dogmatic cut-and-dry classification of disease may appeal to those whose outlook is dominated by the next examination, and who believe that everything they read in their textbooks is true, the more thoughtful student, who has learnt to regard hypothesis as merely a temporary bridgehead for invasion of the territory of new knowledge, soon appreciates the extent of our ignorance, and thereby has taken his first step towards becoming a potential investigator.

Specialisation

The advance of medical science during the present century has been so rapid that there are few who can now hope to master more than a very limited part of the field; and, in consequence, specialisation has developed. I think most people regard specialisation as a necessary evil. We must endeavour to mitigate its ill effects by ensuring that it is grafted on a robust stock of general medicine; for, like the hybrid rose, it will not thrive on its own roots.

Lord Radcliffe (1956) recently referred to the isolation which specialised learning is tending to bring about and suggested that it would lead to a state when even the professional classes would understand each other's concepts and language less and less, and the common ground of enlightened opinion, on which so many people had stood firmly in the past, would shrink to a negligible plot.

Sir William Osler (1919) was keenly aware of this danger. In his presidential address to the Classical Association at Oxford, he said:

"The extraordinary development of modern science may be her undoing. Specialism, now a necessity, has fragmented the specialties themselves in a way that makes the outlook hazardous. The workers lose all sense of proportion in a maze of minutiæ. Everywhere men are in small coteries intensely absorbed in subjects of deep interest, but of very limited scope . . . applying themselves early to research, young men get into backwaters far from the main stream. They quickly lose the sense of proportion, become hypercritical, and the smaller the field, the greater the tendency to megalocephaly."

The fundamental unity of medicine cannot be overemphasised, and it is encouraging that the artificial barrier between the two major specialties—medicine and surgery—which have so many general principles in common, is at last being broken down. In gastro-enterology, in some hospitals, physician and surgeon share the same ward; the dividing-line between neurosurgeon and neurologist is becoming less distinct, and the chest surgeon is coöperating more and more closely with the chest physician and the cardiologist. In conditions such as thyrotoxicosis, medicine and surgery merely offer alternative methods of treatment, and only the clinician who is thoroughly familiar with both sides of the picture is competent to assess their relative merits in a particular patient.

But if this is merely a regrouping, and the barrier between medicine and surgery is replaced by new barriers between specialties concerned with particular organs or systems, we shall be going from the frying-pan into the fire; and, for that reason, it is vitally important that the specialist should have a wide knowledge beyond the bounds of his own specialty.

The narrow specialist, whose field of vision is limited to his own branch, is a menace both to the profession and to the public. He sees illness through tinted glasses. The specialist should be a general physician or surgeon who has added to his knowledge of general medicine a more profound study of one of the specialties. This attitude has been fully endorsed by our College (1947), which, in the training of cardiologists, for example, has recommended that four years should be devoted to postgraduate study in general medicine.

The gap between medicine and gynæcology, unfortunately, has widened. Likewise it is only in comparatively recent years that pædiatrics has split off from general medicine. All would agree that the care of infants and young children calls for special knowledge, for infants are uncoöperative and inarticulate; but there are many who doubt the wisdom of a child with rheumatic heart-disease being under the care of a pædiatrician up to the age of puberty and then, at that critical epoch, suddenly handed over to another specialist. Such discontinuity in management is surely undesirable. It is the disease, not the age, that matters. If a very senior fellow of this College had the misfortune to contract measles or whooping-cough from one of his grand-children, I cannot believe that he would consult a geriatrician!

The dangers of specialisation are not confined to the clinical or even to the preclinical period of medical training; they go back to the schools, and our own committee of medical teaching has emphasised the undesirability of stopping general education at the age of 16 in order to specialise in science. If such a policy is pursued, not only will it lower the standard of education in our profession, but it will exclude many trained in other disciplines—the very people who would bring a wider culture to medicine. It is noteworthy that one of the Cambridge colleges reserves one of its classical scholarships for a man who intends to read medicine.

Sir Harold Himsworth (1955), in his Linacre lecture, drew attention to what he calls the "stratification" of knowledge—that is to say, the tendency for knowledge to be deposited in layers. Horizontally, within each layer, workers are familiar with the work of others in the same subject or specialty; but vertically, between successive layers, communication is often surprisingly poor. Physiologists, for example, are familiar with the work of other physiologists, but may be ignorant of work in clinical medicine which has a direct bearing on their own problems. Team-work is no key to the situation, unless, as Himsworth says, "the experts in a particular field are sufficiently skilled in the other disciplines concerned to be able to talk the language and appreciate the outlook of those other experts whose help is required." The team must be an intellectually integrated unit. Though the basic knowledge of members of such a team may be less than that of the pure specialist, the contribution they can make to the common task may be greater.

We must endeavour to establish a better liaison between the clinical and preclinical departments. The clinico-pathological conference is an example of the type of activity I have in mind, and I would like to see physiologists and anatomists included from time to time; but that is not enough. The keen physician, it is true, does visit the post-mortem room, but it is too seldom, in my experience, that the pathologist is asked to come into the wards. The employment of junior clinicians in the preclinical departments is greatly appreciated by students, both because it introduces them to clinical problems at an earlier stage of their career, and because there is a sense of continuity when they meet their preclinical teachers in the wards.

In training the young physician, care must be taken to guard against narrow specialisation. A trainee who has mastered some difficult and highly specialised technique is apt to be employed for a time, almost exclusively, on that technique, because he can contribute to some research project. He is not being trained: he is being exploited.

Teaching and Research

The primary function of a university medical school is to produce competent practitioners by combining practical experience with theoretical knowledge; but it must also train the future teachers of medicine and contribute to the advancement of knowledge.

It has been said that teaching divorced from research is sterile, and it is certainly true that a man cannot be a good teacher, in the university sense, unless he has the spirit of an investigator—the powers of observation and deduction, combined with the faculty of curiosity.

Research not only rejuvenates teaching by creating an atmosphere of scientific enthusiasm; it also helps to check undue speculation by imposing the proper degree of conservatism in the assessment of results.

But that is not all, for the partnership between teaching and research is mutually beneficial. A distinguished investigator, who was also an able teacher, once told me that he found teaching stimulated research and that, even when teaching a junior class, he had often seen things, in a new light. In his biography of Helmholtz, Professor McKendrick (1899) said:

"There can be no doubt that one of the secrets of the marvellous activity in the research of Helmholtz was that there was the most intimate connection between his function of a professor, whose duty it was to teach, and that of an original investigator. Teaching and investigation went hand in hand. He investigated because he wished to speak of matters at first hand and thus he did not merely recapitulate the views of others. Again and again he took up a problem, so that he might master it himself and be enabled to make it clear to his pupils. Thus there was not only freshness in his teaching, as he was continually breaking new ground, but he was year by year adding to scientific knowledge."

Professor McKendrick goes on to say:

"The example of Helmholtz, therefore, is a strong argument in favour of combining teaching with working; and

the results not only in his case, but in many others, show that, in the advancement of science, it may not be the wisest course to endow research alone and to relegate the researcher to a kind of monastic solitude. It will on the whole be better for him and better for science to prosecute research because he must communicate to others the fruits of his own labours."

These words might well have referred to Harvey himself, who during the forty years he held the Lumleian lectureship was continually expounding the results of his researches.

Research is a much-abused term. There is, I believe, at the present time a tendency, in the selection of young men for junior posts on the staff of our teaching hospitals, to attach too much importance to published work, or perhaps I should say to the amount of work published. One of my friends—a fellow of the Royal Society—once remarked upon the very large number of papers published by a certain young man, and added the pertinent comment: "Where there is so much gas there can't be much pressure behind it."

When we do find a man with a real aptitude for research, let us give him every facility for his work, with free access to clinical material, and encourage him to publish his observations; but surely it is a mistake for those less gifted in this respect to rush into print, merely to get their names into the literature, unless, of course, they have something worth saying.

Twelve years elapsed between Harvey's discovery of the circulation of the blood and the publication of *De Motu Cordis*.

Clinical Teaching

There is apt to be a lag in making the advances of medical science available to the patient. One of our most urgent problems is how to shorten this lag and keep the practitioner in closer touch with the growing-point of knowledge. This is the responsibility of the clinical teacher. Practice, teaching, and research must be brought closer together. The clinical teacher is the middle link of the chain: it is he who must sift the results of scientific research and interpret them to the practitioner in a form that can be applied for the benefit of the patient. Unless he can do this, the chain will break.

The teachers of medicine must be drawn from the best men available and, to attract such men, we must make the posts congenial by offering incentives which will appeal to the best talent. I do not refer to financial incentives; for I am sure you would agree that a teacher should receive adequate remuneration, but that the remuneration offered should not be so generous as to attract those whose interest is in the salary rather than the work.

Good clinical and laboratory facilities and efficient secretarial and technical assistance are obviously essential, but the director of a department should also be freed from as much drudgery and unimportant detail as possible, by making his colleagues responsible for most of the routine and administrative work.

Let us now consider how the concepts to which I have referred can be put into practice. Clearly the teaching personnel is the key to the situation.

What, then, are the qualities we should look for in choosing the director of a clinical department? Although close contact and sympathy with research are essential, executive ability in research is not, I believe, the primary consideration. In such a post, other skills play an important part. The ideal candidate would be an experienced clinician, a good teacher, an able research-worker and a capable administrator; but we can hardly hope to find all these attributes in a single individual—they are to some extent antagonistic. The brilliant research-worker is often a poor teacher; his agile brain makes it hard for him to appreciate the difficulties of his students.

In a lecture to the Manchester Literary and Philosophical Society, the High Master of the Manchester Grammar School, Sir Eric James (1949), said: "There can be few more stimulating experiences for a teacher than the recognition among his pupils of a mind obviously a class higher than his own; but, if the gap is too great, the teacher's usefulness is diminished or removed." I believe that the converse also is true and that, for the average student, the best teacher is one who is ahead of his pupil, but not too far ahead.

In considering the attributes of the director of a clinical department, I put clinical experience first, partly because the full-time chief of a clinical unit has no less responsibility for the welfare of the patients under his care than has his part-time colleague, and partly because, unless he himself is an experienced clinician, he will fail to win the confidence of his clinical colleagues: to do so he must be one whose opinion they respect.

It is surprising that Lewis (1933) should have said: "Appointments to full-time service in medicine must be based neither on professional experience, nor upon capacity in teaching, nor upon simple erudition, but primarily upon distinction in the organisation and accomplishment of work in Clinicial Science." At that time, of course, Lewis could hardly have foreseen the great influx of full-time men which was to occur after the second world war, and the responsibilities they would incur, both in the care of patients and in the teaching of students. He was thinking not of professors of medicine or surgery, but rather of directors of special units devoted to research in applied physiology, or what is sometimes called "experimental medicine"; but, even so, it is surprising that he should have attached so little importance to clinical experience.

How can we combine the science with the art of medicine? The establishment of separate departments of clinical and experimental medicine has been suggested as a possible solution. This would, it is true, cater for men of different tastes, but it would defeat the very object we have in view—the integration of clinical science and clinical medicine—and so rob the clinician of a most stimulating part of his work.

According to Dr. Richard M. Pearce (1913) who became director of the Division of Medical Education of the Rockefeller Foundation after holding a chair in research medicine, departments of research medicine in America were established to meet a want, at a time when heads of clinical departments had little or no training in investigation and no interest in research. Since that defect has now been remedied, the need for such duplication has ceased to exist.

Do not let me give the impression that I underrate the great value of special institutes, or units, devoted to medical research. I am referring merely to departments of research medicine in connection with a teaching school.

A clinical unit has a threefold function to perform—practice, teaching, and research.

The full-time professorial medical and surgical units established after the first world war differed in their teaching from the other hospital firms at that time, in that they devoted more attention to applied physiology. They aimed at giving the student something he did not get elsewhere, and the criticism that they failed to teach clinical medicine was met by the perfectly valid answer that there were plenty of other firms doing that.

The professorial clinical unit of today, however, is no longer merely one of several hospital firms, for the professor is now the director of the whole department. It is he who is responsible for organising the teaching. For that reason I feel it is doubly important that he should be an experienced clinician who has spent some

years of his life in private practice, for it is only thus that he can become familiar with the problems with which his students will be faced, whether as family doctors or consultants.

As I have said, there is no sharp line of demarcation between the clinician and the scientist. The good teacher must be able to regard his subject from both angles; but the director of a clinical department should, in my opinion, be primarily a clinician and only secondarily a scientist.

The professor should have on his staff two experienced senior colleagues of the university grade of "lecturer" (what, in the past, we would have called "assistant physician" or "assistant surgeon"), the one primarily a scientist, free to devote much time to research, the other a clinician who will assist his chief in the routine care of patients and be competent to deputise for him in his absence; for the successful chief contracts many commitments outside his own school.

There should be the closest coöperation between these two lecturers, for it is the interchange of ideas between these different types of mind that is so fruitful in promoting intellectual integration, by enabling each to appreciate the other's point of view and to some extent assimilate his skill.

A team such as I have suggested raises the question: What prospects are there for these young men? If we believe that the professor should have had experience in private practice, then, to fit him for promotion to a chair, the lecturer must be given the opportunity to gain that experience by being allowed to engage in private practice. Such a provision has the further advantage that if, in the course of time, a man finds that he is not really cut out for an academic career, or sees little prospect of promotion to a chair, it is still possible for him to transfer to private practice.

Although wholeheartedly in favour of the full-time principle, Abraham Flexner (1925) approved of the inclusion in the full-time units of some part-time clinicians who participated in the care of patients and in teaching. He wrote:

> "Indeed from the standpoint of both teaching and hospital management [by which he meant, presumably, the care of patients], there are certain things which may be better done by men in active practice then by men who are intensively concerned with problems. The student thus obtains the benefit of a miscellaneous or special clinical experience . . . the patient obtains help that may be beyond the field of interest of any member of the full-time group . . . moreover passage from one group to the other may readily take place as temperament and developing abilities may dictate."

In some quarters there is strong opposition to the idea of university lecturers being allowed to engage in even limited private practice. This objection is based on the belief that, however conscientious a man may be as regards his academic work, it is not possible for him to limit his practice. That is not true. No patient is willing to wait indefinitely for an appointment, no matter how popular the consultant may be, and, by limiting the number of appointments, he will automatically limit his practice.

Visiting patients in their homes is time-consuming; but by providing facilities for private consultation in hospital and restricting private practice to the precincts of the hospital and its private beds, this wastage can be eliminated.

Heart-disease and Pregnancy

Let me now leave the subject of teaching and revert to research. I said that the ability to plan experiments is a rare gift; but sometimes Nature plans them for us, then all we have to do is to ascertain the manner in which Nature has modified the conditions and to observe the results of such modifications.

This is the type of investigation which the average clinician is competent to undertake. It may entail observations extending over a long period of years, in which case it may fall within the province of the family doctor, or it may entail the study of large numbers of cases; then it is only the hospital physician or surgeon who is likely to have access to sufficient clinical material.

One such problem is the effect of pregnancy upon heart-disease. I refer to it as an example of this type of research. As pregnancy advances, the body-weight increases and, in the later months, both heart and lungs are working at a mechanical disadvantage owing to pressure on the diaphragm by the enlarging uterus. Still more important is the fact that, towards the end of pregnancy, the blood-volume is increased by about 50%. This adds greatly to the work of the heart and, if the heart be diseased, may lead to heart-failure.

Considering the clinical importance of this problem, it is surprising that, in the past, it has received such scant attention. The reason for this was clearly appreciated by an obstetrician—Angus Macdonald—who wrote, in 1878, as follows:

> "The reason no doubt is partly due to the too cramping effects of a rigid specialism which tends on the one hand to concentrate the attention of the obstetric practitioner exclusively upon matters purely obstetrical and gynæcological, whilst on the other it affords the pure physician few opportunities to watch the influence of such disorders on particular cases, in as much as the patients are at such times pretty exclusively under the care of a physician-accoucheur."

He then went on to say:

> "But as every woman has not only a uterus and ovaries, but also a liver, heart, lungs, kidneys, etc., it is, I hold, the first duty of every obstetrician to make sure that he is a physician in the first instance and an obstetrician only in the second place."

Macdonald clearly appreciated the dangers of specialisation.

Since those words were written, the "cramping effects of rigid specialism" have greatly increased. The cardiologist gets but fleeting glimpses of the picture, quite inadequate to enable him fully to appreciate its significance, and the obstetrician can hardly be expected to keep abreast of recent advances in cardiology.

Angus Macdonald's book, entitled *The Bearings of Chronic Disease of the Heart on Pregnancy, Parturition and Childbed*, is a landmark in our knowledge of the subject. It was based on a careful analysis of 31 cases, 13 of which he had observed himself. His object was to answer the question: Should I marry, or do I run a great risk in marrying? He felt that the doctor should be in a better position to give a correct answer to this question; though, as he expresses it, "Under such circumstances, ladies will almost invariably ask their doctor's advice, but follow their own liking!"

Whereas most previous workers had made little attempt to differentiate between the various types of heart-disease in relation to pregnancy, he showed that some lesions were more serious than others.

Macdonald regarded chronic heart-disease as a grave contra-indication to marriage, but considered that the mortality might be reduced by certain precautions during pregnancy and delivery.

In Angus Macdonald's day, the clinician's outlook was dominated by morbid anatomy. His aim was to elicit, at the bedside, physical signs which would enable him to diagnose in his patient structural lesions such as he saw in the post-mortem room. The most obvious of such signs were heart murmurs: hence, the importance attached to lesions of the heart valves.

With the turn of the century, medical opinion began to rebel against the dictatorship of the stethoscope: it was becoming obvious that the significance of heart murmurs had been exaggerated. More attention was

paid to symptoms and less to physical signs; the response of the heart to effort was taken as the measure of its efficiency. James Mackenzie was the leading exponent of this school. His central theme was heart-failure.

In his book *Heart Disease and Pregnancy*, published in 1921, and based on observations made at the time he was engaged in midwifery practice in Burnley, Mackenzie denounced auscultation in no uncertain terms. He said: "The hasty conclusions formed by many early observers regarding the significance of murmurs has been like a mill-stone round the neck of the profession." And again: "I am sometimes inclined to think that the discovery of auscultation has actually done more harm than good to the practice of medicine." Mackenzie was apt to overstate his case, in order to carry conviction; but it would be true to say that, as so often happens with some new method, the craze for auscultation had eclipsed the older and more reliable criteria for assessing cardiac efficiency, and it was only with the lapse of time that it came to be seen in its true perspective. Old views tend to come back like old fashions.

Mackenzie recognised that, during pregnancy, many healthy women manifest signs and symptoms simulating those of heart-failure. After the sixth month, breathlessness on exertion is not abnormal; œdema of the legs, due to pressure on the veins by the enlarging uterus, may develop, and increase as pregnancy proceeds, and the apex-beat is displaced outwards by elevation of the diaphragm. Taking these healthy subjects as a control, he proceeded to study the clinical manifestations of heart-failure which might appear in those whose hearts were diseased.

The factors to which Mackenzie attached most importance in prognosis were the response of the heart to effort, and evidence of myocardial damage as shown by cardiac enlargement and auricular fibrillation. He regarded impairment of the exercise tolerance as the earliest sign of heart-failure, but pointed out that, in patients confined to bed, heart-failure might develop at rest, especially in women with mitral stenosis and auricular fibrillation—a combination which he regarded as a definite contra-indication to pregnancy.

The conclusions of Mackenzie and of most of his predecessors were based on very small numbers of cases seen in private practice; but, between the two world wars, workers in this country and elsewhere studied much larger series of cases, drawn from hospital practice. This enabled them to obtain a more comprehensive view. These observations all showed that the two most important considerations in the management and treatment of these patients were adequate antenatal care, with prompt admission to hospital if heart-failure threatened to develop, for at that stage it is reversible; and secondly the avoidance of surgical interference in any form while heart-failure was still uncontrolled.

Mackenzie believed that the heart failed as a whole, and, although he regarded persistent crepitations at the lung bases as one of the earliest signs of heart-failure, he did not differentiate between congestion in the pulmonary and systemic circuits.

In my own clinic, our attention was first clearly focused on this subject in 1941 by 2 patients with severe mitral stenosis, who died of acute pulmonary œdema. The post-mortem findings in these two cases suggested that the catastrophe was due to sudden failure of the left auricle (Bramwell and Jones 1944).

Acute pulmonary œdema is now the most dreaded complication of heart-disease in pregnancy. The danger lies in the suddenness of its appearance. Fortunately it is generally possible to recognise patients in whom this complication is likely to develop, and, in all such, we advise either the termination of pregnancy or mitral valvotomy.

We are now in a much better position than they were in Macdonald's day to answer the question: Should I marry, or do I run a great risk in marrying? Careful clinical observation of large numbers of patients has yielded precise information which enables us to give a more accurate prognosis and, by more efficient management, greatly to reduce the risk of childbirth in women with heart-disease.

This is the type of original work that any physician with adequate hospital facilities is competent to undertake. The results are not spectacular, but such work does contribute to human happiness.

* * *

Practice, teaching, and research are activities which dominate the lives of many Fellows of this College. I have ventured to offer a plea for their coördination. I fear my views may not meet with the approval of you all. They are merely personal opinions, put forward in no spirit of dogmatism, but rather in the hope that you may deem them worthy of consideration at a time when the reform of medical education is such an urgent problem.

REFERENCES

Bramwell, C., Jones, A. M. (1944) *Brit. Heart J.* **6**, 129.
Flexner, A. (1925) Medical Education. New York.
Himsworth, H. (1955) *Brit. med. J.* ii, 217.
James, E. (1949) *Mem. Manchr. lit. phil. Soc.* **91**, 5.
Lewis, T. (1933) The Harveian Oration on Clinical Science. London.
McKendrick, J. G. (1899) Hermann, L. F. von Helmholtz (Masters of Medicine). London.
Mackenzie, J. (1921) Heart Disease and Pregnancy. London.
Osler, W. (1919) *Brit. med. J.* ii, 1.
Pearce, R. M. (1913) Medical Research & Education. New York; p. 84.
Power, D'A. (1897) William Harvey (Masters of Medicine). London.
Radcliffe, Lord (1956) *Lancet*, i, 1.
Royal College of Physicians of London (1947) Report on the Training of Specialists in Cardiology and the Organisation of a Cardiological Service.
—— (1955) Committee on Medical Teaching: third interim report. See *Lancet*, 1956, i, 437.
—— (1956) Committee on Medical Teaching: fourth interim report.

CONTROLLED TRIAL OF EFFECTS OF CORTISONE ACETATE IN CHRONIC ASTHMA

REPORT TO THE MEDICAL RESEARCH COUNCIL BY THE SUBCOMMITTEE ON CLINICAL TRIALS IN ASTHMA *

THE asthma subcommittee was appointed specifically to investigate the value of cortisone in patients with asthma. Cortisone was chosen because of the ease of its administration compared with corticotrophin. It was decided that controlled trials in two phases of the disease would be necessary. The trial in patients with status asthmaticus is the subject of a separate report (Medical Research Council 1956). The present report concerns

* The members of the subcommittee are: Prof. R. V. Christie, F.R.C.P., Dr. J. G. Scadding, F.R.C.P., Dr. J. T. Boyd, Dr. W. Brockbank, T.D., F.R.C.P., Dr. E. T. Conybeare, O.B.E., F.R.C.P., Dr. J. J. R. Duthie, F.R.C.P.E., Dr. A. W. Frankland, Dr. R. Kauntze, M.B.E., F.R.C.P., Dr. M. C. S. Kennedy, Dr. H. Nicholson, F.R.C.P., Prof. G. W. Pickering, F.R.C.P., Prof. F. T. G. Prunty, F.R.C.P., Dr. R. S. Bruce Pearson, F.R.C.P., Sir John Taylor, C.I.E., D.S.O.

The subcommittee was appointed by the Collagen Diseases and Hypersensitivity Panel of the Medical Research Council whose members are: Prof. G. W. Pickering, F.R.C.P., Dr. E. G. L. Bywaters, F.R.C.P., Prof. R. V. Christie, F.R.C.P., Dr. J. J. R. Duthie, F.R.C.P.E., Prof. J. F. Danielli, Dr. P. G. H. Gell, Prof. J. H. Kellgren, F.R.C.P., F.R.C.S., Dr. D. A. Long, Prof. A. Neuberger, F.R.S., Dr. H. Nicholson, F.R.C.P., Prof. F. T. G. Prunty, F.R.C.P., Dr. A. H. T. Robb-Smith, F.R.C.P., Prof. G. Payling Wright, F.R.C.P.

a trial carried out at six centres † in the United Kingdom, in which patients with chronic asthma received either cortisone or placebo tablets. Previous reports suggesting very favourable results with cortisone in chronic asthma have already appeared (Lowell et al. 1953, Savidge and Brockbank 1954, Davies and Williams 1955).

An underlying difficulty of therapeutic trials in asthma is the incompleteness of our knowledge of its causes. Many authorities agree that in many younger patients asthma is due to extrinsic causes, such as sensitivity to plant and other antigens (see Pickering 1952). On the other hand, clinical experience shows that, particularly in older patients, inflammatory and other changes ("chronic bronchitis") play an increasingly important rôle in maintaining disability.

It was intended that this study should be on the effects of cortisone on "chronic bronchial asthma" and not on chronic pulmonary infection. For this reason it was stipulated that the patients selected should not have evidence of severe broncho-pulmonary infection. It was hoped that the patients could be admitted to the trial at a uniform rate throughout the year to minimise the effect of seasonal factors.

A further consideration was the importance of the psychogenic factor. It was essential that patients should be completely ignorant of which of the alternative treatments they were receiving. Apart from the usual measures to ensure this, special precautions were taken to make the placebo tablets, as far as possible, identical with the cortisone tablets. The general plan of the trial involved administration of the tablets in each group for a continuous period of six months, supplemented by the usual antispasmodic therapy. This was to be succeeded by a follow-up period of three months. It was desired to determine the possibility of withdrawing cortisone treatment during this period and the relative condition of the patients who had received the two types of treatment.

Material and Methods

Type of Patient

The trial was carried out among patients with chronic asthma attending hospital outpatient departments. It was agreed that patients to be included in the trial must (*a*) be between 14 and 60 years of age; (*b*) have an asthma history of not less than three months' duration; and (*c*) have had no complete remission of more than two weeks during the preceding 3 months. An additional criterion was that the dyspnœa present should, in the opinion of the physician, be due in large part to bronchial asthma; patients with severe broncho-pulmonary infection were excluded. Those with any signs or history of cardiac failure or tuberculosis were excluded because of the possibility of untoward effects of cortisone.

Allocation to Treatment

The two treatment groups were constituted by random allocation. Patients in one group received cortisone acetate and in the other group placebo tablets. The latter each contained quinine dihydrochloride 0·6 mg., lactose 138 mg., starch 22 mg., and a trace of magnesium stearate, and were indistinguishable, as regards size, shape, colour, and bitterness, from the cortisone tablets (25 mg.).

Supplies of tablets sufficient to treat each patient were made available to participating hospitals in bottles labelled and numbered 1, 2, 3, 4 . . . Within each centre the bottles were allocated to patients in the same order as that in which they were admitted to the trial. The contents of individual bottles were determined by a random-order list, which was held centrally; they were not disclosed to either clinicians or patients until the end of the trial. Should the clinician decide on ethical grounds that the patient was doing so badly that, in the event of his receiving placebo tablets, cortisone or other treatment (such as corticotrophin) should be given, he could be quickly informed of the nature of the treatment and the patient withdrawn from the trial.

Treatment

A standard initial dosage was agreed on and was applicable to patients receiving both cortisone and placebo tablets. Each patient received 300 mg. of cortisone acetate, or the equivalent number of placebo tablets, on the first day of the trial; 200 mg. on the second and third days; and 100 mg. daily for the next 4 days. After the first week the physician was asked to adjust the dosage to suit requirements of individual patients. It was specified that, at all dosage levels, tablets should be given in divided doses as follows:

Dosage (mg.)	*Number of tablets (25 mg.)*		
	Morning	*Midday*	*Evening*
300·0	4	4	4
200·0	3	2	3
100·0	1½	1	1½
87·5	1	1	1½
75·0	1	1	1
62·5	1	½	1
50·0	½	½	1
37·5	½	½	½
25·0	½	..	½

All the patients were to be treated for 24 weeks and followed up for 12 further weeks, during which an attempt was to be made to withdraw the drug, aiming at total withdrawal. In addition to the trial tablets all the patients received any antispasmodic therapy considered necessary by their physician.

Assessment

Clinical assessment of each patient was required on entry to the trial, and then once every fortnight during the treatment and follow-up periods. Each assessment included (*a*) physical examination; (*b*) an evaluation of exercise tolerance using five arbitrarily defined grades; (*c*) an arbitrary assessment of incapacity for work due to ashthma during the previous fourteen days; and (*d*) a measurement of vital capacity. Side-effects of the trial tablets and additional requirements of standard antispasmodic therapy were recorded.

Results

96 patients from six centres were admitted to the trial, 49 being allocated to treatment with cortisone and 47 to the control group. Details of the patients by sex, age, duration of asthma, number of previous attacks of status asthmaticus, and time of year in which they were admitted to the trial are given in table I. There was a slightly higher proportion of younger women in the control group, but in other respects the two groups were closely similar.

Withdrawals from Trial

The penultimate column in table II records the number of patients removed from the trial on account of either treatment changes or failure to attend for subsequent assessments. Altogether 9 cortisone and 10 control patients were removed from the trial during the treatment period, the reasons for their removal being as follows:

Cortisone:

1. Male, aged 28 years; appendicectomy followed by acute psychoneurotic illness. Treatment stopped after 2 weeks.

† The Centres taking part in the trial were: Manchester Royal Infirmary (Dr. W. Brockbank, Dr. R. S. Savidge, Dr. H. Brebner); Wright-Fleming Institute, St. Mary's Hospital, London (Dr. A. W. Frankland, Dr. S. Lewis); Guy's Hospital, London (Dr. R. Kauntze, Dr. J. R. Trounce); King's College Hospital, London (Dr. R. S. B. Pearson, Dr. F. I. Rackow); Brompton Hospital, London (Dr. J. G. Scadding, Dr. J. Pepys); University College Hospital (Dr. H. Nicholson, Mrs. M. E. Turner-Warwick). The subcommittee is indebted to Dr. J. T. Boyd, of the Medical Research Council's Statistical Research Unit, for his analysis of data in the trial.

TABLE I—COMPARISON OF PATIENTS IN CORTISONE AND CONTROL GROUPS AT START OF TRIAL

Age and sex distribution					Duration of asthma		
Age (yr.)	Cortisone		Control		Duration (yr.)	Cortisone	Control
	M	F	M	F			
Under 30	6	3	5	6	Less than 5	6	7
30–	2	6	4	10	5–	8	7
40–	7	10	5	9	10–	16	22
50–59	5	9	4	3	20 +	17	11
Not stated	0	1	1	0	Not stated	2	0
Total	20	29	19	28		49	47

No. of previous attacks of status asthmaticus			Seasonal distribution		
No. of attacks	Cortisone	Control	Month of admission to trial	Cortisone	Control
0	22	19	Jan.–March	15	13
1–3	16	17	April–June	8	6
4–6	4	6	July–Sept.	4	6
7 +	3	2	Oct.–Dec.	21	22
Not stated	4	3	Not stated	1	0
Total	49	47		49	47

2. Female, age not stated; acute duodenal ulcer. Treatment discontinued after 2 weeks.

3. Male, aged 54 years; little help from tablets, "sudden panics," very considerable psychological element present. Removal from trial after 2 weeks.

4. Female, aged 55 years; admitted to hospital in status asthmaticus; trial abandoned after 2 weeks.

5. Male, aged 48 years; defaulted after 8 weeks.

6. Female, aged 40 years; became pregnant. Obstetrician requested discontinuation of trial after 12 weeks.

7. Male, aged 17 years; severe and persistent status asthmaticus at 20 weeks. Withdrawn from trial and put on known cortisone.

8. Female, aged 35 years; defaulted after 20 weeks.

9. Female, aged 54 years; removed from trial after 20 weeks' treatment, owing to incidental finding of a tuberculous kidney.

Control:

1. Male, aged 57 years; defaulted after 2 weeks.

2. Male, aged 45 years; admitted to hospital in status asthmaticus and removed from trial after 2 weeks.

3. Female, aged 57 years; defaulted after 4 weeks.

4. Male, aged 41 years; defaulted after 8 weeks.

5. Female, aged 21 years; admitted to hospital in status asthmaticus and removed from trial after 8 weeks.

TABLE II—PHYSICAL EXAMINATION (NUMBER OF PATIENTS WITH GIVEN CLINICAL GRADES* AT DIFFERENT POINTS OF TREATMENT)

Time of assessment	Treatment group	Clinical grade			No. removed from trial	Total
		1	2	3		
Start of trial	Cortisone	3	14	31	..	48†
	Control	*6*	*19*	*22*	..	*47*
Week 2	Cortisone	18	16	14	..	48*
	Control	*12*	*14*	*21*	..	*47*
Week 4	Cortisone	17	15	13	4	49
	Control	*11*	*18*	*16*	*2*	*47*
Week 6	Cortisone	18	14	13	4	49
	Control	*13*	*13*	*18*	*3*	*47*
Week 8	Cortisone	20	11	14	4	49
	Control	*13*	*12*	*19*	*3*	*47*
Week 16	Cortisone	20	13	10	6	49
	Control	*18*	*11*	*10*	*8*	*47*
Week 24	Cortisone	15	12	13	9	49
	Control	*19*	*9*	*9*	*10*	*47*
Follow-up	Cortisone	11	7	17	14	49
	Control	*16*	*7*	*12*	*12*	*47*

* Clinical grades (based on auscultatory findings):
Grade 1: no added sounds.
Grade 2: rhonchi present, but not constant and widespread.
Grade 3: constant and widespread rhonchi.
† No record was made for 1 patient in the cortisone group.

6. Female, aged 48 years; admitted to hospital in status asthmaticus and removed from trial after 10 weeks.

7. Female, aged 33 years; defaulted after 10 weeks. Later stated she had no asthma for 3 months after giving up tablets.

8. Female, aged 50 years; admitted to hospital in status asthmaticus and removed from trial after 12 weeks.

9. Male, aged 55 years; admitted to hospital in status asthmaticus and removed from trial after 18 weeks.

10. Male, aged 33 years; defaulted after 18 weeks.

The most frequent causes of removal from the trial were therefore default of the patient and onset of status asthmaticus. Each of these causes was responsible for the removal of 5 patients from the control group (i.e., together they explained all removals from this group), and 2 from the cortisone-treated patients.

Clinical Assessment

Physical examination.—The results of physical examination on entry and at different points of treatment are presented in table II. At the start of the trial the cortisone group has, by chance, the less favourable pattern in this respect, 31 patients being assessed as having constant and widespread rhonchi (i.e., grade 3), compared with 22 patients similarly assessed in the control group. By the end of the first 2 weeks of treatment the relative positions of the groups are reversed: 18 patients in the cortisone group are now free from added sounds (i.e., grade 1), compared with only 12 in the control group; and the number of cortisone patients in grade 3 is reduced from 31 to 14, while the number of control patients placed in this grade remains virtually the same at 21. The improvement shown by the cortisone group during the first 2 weeks reaches levels of technical significance ($\chi^2 = 17{\cdot}28$, $n = 2$, $P < 0{\cdot}001$), and their advantage at this stage is the more noteworthy in view of the group's relatively unfavourable position at the start of the trial. In both groups, apart from minor fluctuations, there are no further changes up to week 8, but thereafter a more definite improvement is shown by the control group, with the result that by 16 weeks the initial advantage of the cortisone group has disappeared and the patterns displayed by the groups are closely similar. At the end of the treatment period (i.e., at 24 weeks) auscultation did not reveal any added sounds in 15 of the cortisone patients and 19 patients in the control group.

TABLE III—NUMBER OF PATIENTS WITH GIVEN GRADE OF EXERCISE TOLERANCE AT DIFFERENT POINTS OF TREATMENT*

Time of assessment	Treatment group	Exercise tolerance					No. removed from trial	Total
		1	2	3	4	5		
Start of trial	Cortisone	1	7	18	16	6	..	48†
	Control	*2*	*7*	*17*	*11*	*10*	..	*47*
Week 2	Cortisone	6	16	13	7	6	..	48†
	Control	*2*	*11*	*13*	*11*	*10*	..	*47*
Week 4	Cortisone	5	23	9	4	4	4	49
	Control	*4*	*9*	*15*	*7*	*10*	*2*	*47*
Week 6	Cortisone	5	21	11	3	5	4	94
	Control	*2*	*13*	*12*	*10*	*7*	*3*	*47*
Week 8	Cortisone	8	21	7	5	4	4	49
	Control	*4*	*10*	*13*	*11*	*6*	*3*	*47*
Week 16	Cortisone	11	17	11	2	2	6	49
	Control	*9*	*9*	*11*	*3*	*7*	*8*	*47*
Week 24	Cortisone	8	20	5	6	1	9	49
	Control	*9*	*11*	*13*	*4*	..	*10*	*47*
Follow-up	Cortisone	4	14	10	5	2	14	49
	Control	*6*	*10*	*10*	*4*	*5*	*12*	*47*

* Exercise-tolerance grades were:
Grade 1: as good as that of others of same age and build.
Grade 2: able to walk with others of same age and build on level, but cannot keep up on hills or stairs.
Grade 3: unable to keep up with normals on level, but can walk a mile or more at own speed.
Grade 4: unable to walk a mile, even at own speed, without occasional rests.
Grade 5: unable to leave house without transport because of breathlessness.
† No record was made for 1 patient in the cortisone group.

TABLE IV—ABILITY TO WORK DURING PREVIOUS FORTNIGHT

Time of assessment	Treatment group	No. of patients				Total
		Able to work		Unable to work	No. removed from trial	
		Full time	Part time			
Start of trial	Cortisone	20	11	17	..	48*
	Control	*16*	*14*	*17*	..	*47*
Week 2	Cortisone	26	3	19	..	48*
	Control	*18*	*13*	*16*	..	*47*
Week 4	Cortisone	25	7	13	4	49
	Control	*20*	*11*	*14*	*2*	*47*
Week 6	Cortisone	26	8	11	4	49
	Control	*18*	*11*	*15*	*3*	*47*
Week 8	Cortisone	28	5	12	4	49
	Control	*19*	*13*	*12*	*3*	*47*
Week 16	Cortisone	28	8	7	6	49
	Control	*23*	*8*	*8*	*8*	*47*
Week 24	Cortisone	27	8	5	9	49
	Control	*24*	*7*	*6*	*10*	*47*
Follow-up	Cortisone	24	5	6	14	49
	Control	*18*	*9*	*8*	*12*	*47*

* No record was made for 1 patient in the cortisone group.

Exercise tolerance.—Table III presents the results of exercise-tolerance assessments of patients in the two groups. At the start of the trial there was a close similarity between cortisone and control patients in their distribution over the five arbitrary grades. At the end of the first fortnight, however, the cortisone group shows an advantage, in that a larger proportion of them are placed in the two highest grades, 1 and 2. Thus, at this stage, 22 cortisone patients were assessed as at least able to walk on the level as well as others of the same age and build, compared with 13 patients in the control group. Correspondingly at the other end of the scale there are 21 control patients who are unable to walk a mile, even at their own speed (i.e., grades 4 and 5), but only 13 cortisone patients. This advantage to the cortisone group is somewhat increased up to week 8 and, though subsequently diminished by a late improvement among the control patients, remains evident to the end of the treatment period, when 28 of the cortisone patients are placed in the two most favourable grades compared with 20 patients in the control series. These differences between the treatment groups as regards exercise tolerance reach levels of technical significance‡ for the assessments at weeks 4, 6, and 8.

Ability to work.—Data concerning the patients' working histories during different fortnightly periods are given in table IV. The histories of the two groups for the fortnight preceding the start of the trial were reasonably comparable. The numbers of patients totally unable to work were 17 in each group, and for both cortisone and control patients these numbers declined until, at the end of the treatment period, there were only 5 and 6 patients respectively remaining in this category. Again at the start of the trial there were 31 cortisone and 30 control patients who were at least able to do some work. Among these patients, however, there was a slightly higher proportion of the group allocated to cortisone who were able to work full time (20 of 31 compared with 16 of 30 control patients). This difference between the proportions of full-time workers among those able to work increased during the early stages of the trial until, by week 8, 28 of the 33 cortisone "workers" were doing full time compared with 19 of the corresponding 32 control patients. After week 8, however, the difference between the treatment groups diminished, and by week 24 the proportions of "workers" working full time were almost identical; 27 of 35 cortisone patients and 24 of 31 control patients.

Vital capacity.—Recordings of vital capacity at both the start of the trial and the end of the treatment period were available for 37 cortisone and 36 control patients. From these paired recordings there was no evidence of any material difference between the vital-capacity changes in the two treatment groups (table V). In the cortisone group 19 patients showed an increase and 18 a decrease in vital capacity, while the corresponding numbers among the control series were 21 and 14 respectively. The average changes were positive and at a similar level in both groups.

Side-effects

Possible side-effects were recorded in 27 of the patients receiving cortisone. Most of these patients had more than one complication, the most frequent being weight gain, œdema, and hypertension. Details of the side-effects were as follows (the figures in parentheses indicating the number of control patients for whom similar findings were recorded):

	No. of patients
Weight gain of more than 20 lb.	6 (2)
Weight gain of 10–20 lb.	17 (4)
Œdema	10 (2)
Hypertension (rise of diastolic pressure exceeding 20 mm. Hg with a minimal final diastolic pressure exceeding 90 mm. Hg)	11 (3)
Moon-face	3 (0)
Albuminuria	3 (0)
Glycosuria	1 (0)
Raised jugular venous pressure	1 (0)

Examination of changes in weight during the first 4 weeks of treatment revealed that 15 cortisone patients had gained more than 5 lb. during this period. The weight gain for 4 of these patients was in the range of 10–15 lb., and for a single patient the gain exceeded 15 lb. During the same period only 3 patients in the control group gained 5 lb. in weight, and in each case the gain was less than 10 lb.

TABLE V—CHANGES IN VITAL CAPACITY DURING TREATMENT PERIOD (BASED ON PAIRED RECORDINGS FOR 37 CORTISONE AND 36 CONTROL PATIENTS)

Change in vital capacity (c.cm.)		Treatment group	
		Cortisone	Control
+ve	1000 +	3	2
	500–	8	7
	1–499	8	12
	0	..	1
−ve	1–499	11	12
	500–	6	2
	1000 +	1	..
Total		37	36
Average change (c.cm.)		+130	+140

Use of other Antispasmodic Treatment

Nearly all the patients in both treatment groups received antispasmodic treatment throughout the trial. The use of antispasmodics in the two groups was very similar, and at no time during the trial were more than 5 of the cortisone-treated and 4 placebo-treated patients not receiving these drugs.

Follow-up

Though it was hoped, if possible, to withdraw the tablets during the 12-week follow-up, many patients in both treatment groups were still receiving tablets at the end of this period. The individual dosages of trial tablets being administered at the end of the follow-up are given in table VI, which also presents, for comparison, details of maintenance doses at the mid-point of the treatment period. At the end of the follow-up tablets had been

‡ The distributions of the cortisone and control groups were compared after combining grades 1 and 2 and grades 4 and 5. Application of the χ^2 test to these comparisons at weeks, 4, 6, and 8 gave the following values:

Week 4 $\chi^2 = 10{\cdot}22$ n = 2, $P<0{\cdot}01$
Week 6 $\chi^2 = 6{\cdot}19$ n = 2, $P<0{\cdot}05$
Week 8 $\chi^2 = 9{\cdot}46$ n = 2, $P<0{\cdot}01$

TABLE VI—DAILY DOSES BEING ADMINISTERED AT MID-POINT OF TREATMENT PERIOD, AND END OF FOLLOW-UP PERIOD

Tablets daily (cortisone 25 mg. or placebo equivalent)	No. of patients on given dose			
	Mid-point of treatment period		End of follow-up period	
	Cortisone	Control	Cortisone	Control
8	..	1	..	..
6	1	1	..	..
5	1	2	1	..
4	8	14	1	1
3½	1	1	..	..
3	15	15	5	6
2½	4	3	2	1
2	8	2	4	5
1½	5	1	2	..
1	1	..	3	2
½	..	..	1	..
0	..	..	16	20
Patients removed from trial	5	7	14	12
Total	49	47	49	47

completely withdrawn from only 16 of the cortisone and 20 of the control patients remaining in the trial, and in both groups there were patients still receiving as many as four tablets daily.

Of the 77 patients remaining in the trial at the end of the treatment period 7 (5 cortisone and 2 control) failed to complete their 12-week follow-up :

Cortisone :

1. Male, aged 42 years ; status asthmaticus during 4th week of follow-up, admitted to another hospital and died about a fortnight later without cortisone or corticotrophin treatment (cortisone had been withdrawn before the onset of status asthmaticus).

2. Male, aged 26 years ; defaulted after 2 weeks' follow-up (receiving cortisone 25 mg. daily before default).

3. Male, aged 52 years ; defaulted after 4 weeks' follow-up (not receiving cortisone at time of default).

4. Male, aged 41 years ; transferred to different asthma clinic after 6 weeks' follow-up, was well on ephedrine, no further record (not receiving cortisone when transferred).

5. Male, aged 53 years ; removed from trial after 6 weeks' follow-up, " has had a very bad month and is very wheezy," transferred to known cortisone (at time of removal from trial patient was receiving cortisone 50 mg. daily).

Control :

1. Female, aged 52 years ; no detailed records available after end of treatment period, was reported to have been subsequently admitted to hospital without either cortisone or corticotrophin producing any effect on her symptoms.

2. Female, aged 24 years ; admitted to another hospital in status asthmaticus after 8 weeks' follow-up, no further records available (dosage of placebo tablets had been reduced from 2½ to ½ tablet daily at time of onset of status).

The results of follow-up physical examinations and assessments of exercise tolerance and ability to work are presented in the bottom rows of tables II, III, and IV respectively. In each of these respects both groups showed some deterioration from the assessments (week 24) at the end of the treatment period. There was, however, little difference between the two treatment groups in the follow-up evaluations of physical findings, exercise tolerance, and ability to work. These final assessments were made for 35 patients in each group, of whom 11 patients treated with cortisone and 16 in the control group had clear chests on auscultation ; 18 cortisone and 16 control patients were assessed as at least " able to walk on the level " with others of same age and build ; and 29 cortisone and 27 control patients were working during the previous fortnight, the numbers doing so full-time being 24 and 18 respectively.

Discussion

The sample of patients studied was regarded as satisfactory for the purpose of this trial. Although the attempt to admit patients to the trial evenly through the year was not successful, the seasonal distribution in the two groups was similar. 36 of the 49 patients given cortisone and 35 of the 47 receiving placebo were admitted between October and March inclusive.

There is unequivocal evidence of a slight but definite advantage for the cortisone-treated patients as regards improvement in physical signs and exercise tolerance from the 2nd to the 8th week of treatment. From then on to the 24th week of treatment in both respects the control patients gained ground, with the result that at the end of this period there was very little to differentiate between the two groups. As regards increased ability to work, the use of cortisone showed no advantage in enabling those to work who were initially unable to do so. Among those initially fit for part-time work return to full-time work was slightly facilitated by cortisone during the first 8 weeks ; but after this the control patients gained and were as well off as those treated with cortisone. Thus the patient was at first better off from the point of view of exercise tolerance when treated with cortisone, but this improvement was not so great as to make a really significant gain in work capacity, and there was no diminution of the need for antispasmodic therapy. There was a slightly higher proportion of young patients in the control group, but separate analysis of the groups under and over the age of 40 years revealed that the older patients responded, if anything, better to cortisone. The changes in vital capacity showed wide and similar variations in the cortisone and control groups. The personal impressions of the clinicians were that 23 of the cortisone patients were improved during the trial, compared with 12 of those receiving placebo. These impressions may in a few cases have been influenced by a feeling of well-being by the patients or possibly by the coexistence of side-effects, such as œdema.

The reasons leading to patients being withdrawn from the trial are of interest. There were 9 of these in the cortisone group. Two who defaulted may be presumed to have little help from cortisone. Two actually developed status asthmaticus in spite of the benefit of cortisone in this condition (see Medical Research Council 1956), one while receiving cortisone 100 mg. daily and the other 75 mg. Of the patients on placebo treatment only 10 were withdrawn ; 5 defaulted presumably because of inadequate benefit, and the other 5 developed status asthmaticus. These differences give support to the previous findings of early advantages for the cortisone patients.

In view of the findings during the follow-up period of 3 months it is noteworthy that difficulties were encountered in withdrawing tablets from both groups of patients, 19 remaining on cortisone and 15 on placebo tablets. Since physicians had been asked to withdraw tablets if possible during this period, it is clear that patients receiving either type of tablet thought they were deriving benefit from them. The numbers of tablets of each kind given during the follow-up period were similar. These facts confirm the conclusion, based on assessment at the end of the 6 months' treatment period, that at this stage cortisone was causing no specific benefit. The reasons given for the removal of patients from the trial during the follow-up period are similar to those given for removal during the course of the trial. One patient was removed from the trial and given cortisone, although it later became apparent that at the time of withdrawal from the trial he had in fact been receiving cortisone 50 mg. daily.

Further observations of interest were made over an interval of from 6 to 22 months after the follow-up period. Data were available from 36 patients who received cortisone in the trial. 22 were still receiving it, and 12 of these were reported to be doing well ; 14 were

not receiving it, and 7 of these were reported to be well. At one of the hospitals there was a tendency to avoid the further use of cortisone, whereas, by contrast, at four others the tendency was to continue it. The reasons for these tendencies were not clear. Information was available about 27 patients who had received the placebo in the trial. Treatment without cortisone was continued in 10 patients, of whom 6 were reported to be well. Seventeen received cortisone or corticotrophin after the end of the trial, and 6 of these were reported to be well. The proportion of patients whose asthma was controlled is strikingly similar in the various groups, but some patients who had not received cortisone in the trial appeared to benefit later from the administration of either cortisone or corticotrophin.

The side-effects of cortisone during this trial were not particularly troublesome and, with one or two doubtful exceptions, did not necessitate interruption of treatment. The psychoneurosis which developed in one patient and the duodenal ulcer in another after 2 weeks' treatment may have been caused in part by cortisone, but may have been of old standing and exacerbated by it. It is possible that in the patient in whom tuberculosis of the kidney was discovered after 20 weeks' treatment the progress of this condition may have been accelerated.

The patient dying in status asthmaticus after the withdrawal of cortisone might be cited as a warning about possible dangers of this procedure. The unequivocal side-effects are, of course, those usually associated with cortisone, headed by significant weight gain in 50% and œdema in 20%. There seemed to be no evidence that the onset of œdema was associated with any important degree of cardiac failure. A much smaller, but noticeable, proportion of patients receiving the placebo were recorded as having gained weight and developed œdema. The remaining side-effects of cortisone were mild. A few patients developed hypertension of mild degree and insufficient to be a practical problem. None of the cortisone-treated patients had to be withdrawn from the trial on account of side-effects, but this may be due to careful selection of the patients admitted to exclude those with cardiac failure and other contra-indications.

Conclusion

The general conclusion to be drawn from the trial is that the patients receiving cortisone were subjectively and objectively improved during the first 2 months of treatment to a greater extent than those receiving the placebo, both groups simultaneously receiving antispasmodics. The early improvement with cortisone treatment was hardly sufficient to make a significant contribution to improved capacity for work, and cannot by any standard be regarded as dramatic or as great as that shown in patients with status asthmaticus (see Medical Research Council 1956). This early improvement was not maintained, and by the end of the trial the cortisone-treated group showed no significant advantage over the control group.

Summary

The effect of cortisone-acetate tablets was compared with that of placebo tablets in outpatients with chronic asthma, simultaneously receiving routine antispasmodic treatment.

96 patients were studied: 49 in the cortisone group and 47 in the control group. Treatment continued for 6 months.

Particularly as regards diminution of rhonchi and exercise tolerance, there was a partial, but significant, advantage to the cortisone-treated group during the first 8 weeks. From then to the end of the 6 months and during 3 months' follow-up this advantage gradually disappeared.

Difficulty was encountered in withdrawing both cortisone and placebo tablets in the follow-up period.

In the selected patients studied side-effects of cortisone in the doses used were not severe enough to cause practical difficulties.

We wish to thank the physicians who referred cases for inclusion in the trial, and Messrs. Roussel Laboratories Limited, who very generously provided the large number of placebo tablets.

REFERENCES

Davies, B. M., Williams, D. A. (1955) *Brit. med. J.* ii, 293.
Lowell, F. C., Schiller, I. W., Leard, S. E., Franklin, W. (1953) *J. Allergy*, **24**, 112.
Medical Research Council (1956) *Lancet*, ii, p. 803.
Pickering, G. W. (1952) *Brit. med. J.* i, 1207.
Savidge, R. S., Brockbank, W. (1954) *Lancet*, ii, 889.

CONTROLLED TRIAL OF EFFECTS OF CORTISONE ACETATE IN STATUS ASTHMATICUS

REPORT TO THE MEDICAL RESEARCH COUNCIL BY THE SUBCOMMITTEE ON CLINICAL TRIALS IN ASTHMA *

SINCE the early reports of the use of cortisone in asthma (e.g., Carryer et al. 1950) there has been a good deal of agreement about its value in the treatment of patients in status asthmaticus. Recent papers (Ball 1954, Pearson 1955) have reported satisfactory results from the treatment of small groups of patients suffering from this condition. It is known, however, that the treatment of status asthmaticus with antispasmodic drugs is successful in a high proportion of patients, and it seemed advisable to compare, with proper precautions, the effectiveness of cortisone with that of antispasmodic drugs. Cortisone was selected for the trial because it was known to be likely to become freely available and also because of the ease of its effective administration by mouth compared with corticotrophin, which must be given by intramuscular injection. Thirteen centres participated in the trial.†

Material and Methods

Type of Patient

It was agreed that the patients in status asthmaticus to be included in the trial must (*a*) be more than 14 years of age; (*b*) have had at least one previous severe attack of asthma; and (*c*) not have received any previous cortisone therapy. All patients admitted to hospital who met these requirements received "standard" treatment during the first 24 hours. The "standard" treatment received was determined by the normal practice of the clinician in charge of the patient, and might include (*a*) adrenaline 1 in 1000 solution subcutaneously, (*b*) aminophylline intravenously, (*c*) isoprenaline 1% inhaled,

* The members of the subcommittee are given on p. 798.

† Centres taking part in the trial: Chase Farm Hospital (Dr. T. Simpson); Crumpsall Hospital, Manchester (Dr. R. W. Luxton); Guy's Hospital, London (Dr. R. Kauntze, Dr. J. R. Trounce); King's College Hospital, London (Dr. R. S. B. Pearson, Dr. F. I. Rackow); Manchester Royal Infirmary (Dr. W. Brockbank, Dr. R. S. Savidge, Dr. Hugh Brebner); Northern General Hospital, Edinburgh (Dr. I. W. B. Grant, Dr. A. R. Somner); Queen Elizabeth Hospital, Birmingham (Prof. W. M. Arnott, Dr. John Butler); Royal Hospital, Sheffield (Prof. C. H. Stuart-Harris); St. Bartholomew's Hospital, London (Dr. N. Oswald); St. David's Hospital, Cardiff (Dr. D. A. Williams); St. Thomas's Hospital, London (Dr. H. J. Anderson, Dr. D. S. Cadman); University College Hospital, London (Dr. H. Nicholson, Mrs. M. E. Turner-Warwick); Wright-Fleming Institute, St. Mary's Hospital, London (Dr. A. W. Frankland). The subcommittee is indebted to Dr. J. T. Boyd, of the Medical Research Council's Statistical Research Unit, for his analysis of data in the trial.

(*d*) oxygen, (*e*) antibiotics, and (*f*) sedatives. During the first 12 hours an attempt was made to establish the dosage of antispasmodic required, and, whenever possible, the dosage established was not increased, nor were any additions made to therapy, during the second 12 hours. At the end of this initial treatment period patients who remained in status asthmaticus were admitted to the trial, which was thus concerned only with those in whom "standard" methods of treatment had failed over a period of 24 hours.

Allocation of Treatment

In a trial of this nature it was obviously impossible that the control group should receive placebo treatment alone, and on ethical grounds it was desirable that the cortisone group also should continue to receive the benefit of normal standard treatment for status asthmaticus. The contrast made, therefore, was between standard methods plus cortisone and standard treatment alone. The two treatment groups were formed by random allocation at the time of admission to the trial. Cortisone acetate was given in the form of 25 mg. tablets, and patients not receiving cortisone were given placebo tablets prepared so as to be as nearly as possible indistinguishable in size, shape, colour, and taste from the cortisone tablets (see Medical Research Council 1956).

Supplies of tablets were made available to centres in labelled bottles each containing sufficient to treat one patient and numbered 1, 2, 3, 4 . . . Within each centre numbers were allotted to patients in the order in which they were admitted to the trial. The contents of individual bottles were determined by a random-order list, which was held centrally; they remained unknown to clinicians and patients in the participating centres during the whole course of the trial.

Treatment

A standard dosage schedule was agreed on and was applicable to patients receiving both cortisone and placebo tablets. The specified course, given in divided doses, was as follows:

Day 1.—350 mg.: 2 tablets immediately, 1 tablet every hour for 8 hours, 1 tablet every 4 hours.
Day 2.—200 mg.: 2 tablets every 6 hours.
Days 3–9.—Dosage reduced by 25 mg. daily.
Day 3.—175 mg.: 2 tablets, followed by 2 tablets 6 hours later, then $1^1/_2$ tablets every 6 hours.
Day 4.—150 mg.: $1^1/_2$ tablets every 6 hours.
Day 5.—125 mg.: 2 tablets, then 1 tablet every 6 hours.
Day 6.—100 mg.: 1 tablet every 6 hours.
Day 7.—75 mg.: 2 tablets, then 1 tablet after 12 hours.
Day 8.—50 mg.: 1 tablet 12-hourly.
Day 9.—25 mg.: $^1/_2$ tablet 12-hourly.
Days 10–14.—No cortisone or placebo tablets given.

The total amount of cortisone given to patients in the "treated" group was thus 1·25 g., while the control patients received, in total, an exactly equal number of placebo tablets (50). All the patients continued to receive whatever standard treatment was considered necessary by their physicians, and the proviso was made that, in the event of any patient's condition causing serious concern, the tablets might be discontinued and the patient receive any treatment, including known cortisone, preferred by the clinician.

Assessment of Patients

Clinical assessment of each patient was required twice on the day immediately before the start of treatment with cortisone or placebo tablets, twice on the first day of the trial, and then once daily for 14 days, or until the patient was discharged from hospital. Each assessment included (*a*) an evaluation of the degree of bronchial obstruction present, using five arbitrarily defined clinical grades; and (*b*) temperature, respiration-rate, and pulse-rate, for each of which recorded maxima and minima were requested. In addition, details were required of the standard treatment (antispasmodics, &c.) received by each patient.

TABLE I—COMPARISON OF PATIENTS IN CORTISONE AND CONTROL GROUPS AT START OF TRIAL

Age and sex distribution

Age (yr.)	Cortisone		Control	
	M	F	M	F
Under 20	0	1	1	0
20–	1	3	2	2
40–	2	6	5	5
60+	0	2	0	2
Total	3	12	8	9

Seasonal distribution

Month of admission	Cortisone	Control
Jan.–March	6	4
April–June	4	5
July–Sept.	3	4
Oct.–Dec.	2	4
	15	17

Duration of asthma

Duration (yr.)	Cortisone	Control
Under 1	0	1
1–10	7	7
11–20	4	7
21+	4	2
Total	15	17

Severity of asthma before present attack

Severity[1]	Cortisone	Control
Discomfort	6	8
Unable to work	5	7
Confined to bed	1	2
Not recorded	3	0
	15	17

Results

32 patients from twelve hospitals were admitted to the trial: 15 in the cortisone group and 17 in the control group. These relatively small numbers were undoubtedly because of the requirement that only patients in whom "standard" methods of treatment had failed over a period of 24 hours could be accepted. In practice, the majority of patients admitted in status asthmaticus to the participating hospitals showed sufficient improvement during this initial treatment period to exclude themselves from the trial—i.e., they were no longer in status asthmaticus.

Details of the patients by age, sex, duration of asthma, severity of asthma before present attack, and time of year in which they were admitted to hospital are given in table I. There was, by chance, some difference in the sex composition of the two groups, 12 of 15 patients in the cortisone group being females, as opposed to 9 of 17 in the control group. For each of the other characteristics, however, there was close similarity between the two groups on admission to the trial.

Clinical Assessment

The results of clinical assessment of the patients are presented in table II for the day preceding the trial (day 0) and at successive intervals therafter. On the day before trial therapy commences all patients are in status asthmaticus (i.e., grades 4 or 5), but some improvement is apparent as early as day 1, though at this stage there is little to choose between the two treatment groups. By day 2 the cortisone group begins to show an advantage, and this advantage is more marked by day 4, when 10 of the 15 cortisone patients have reached the two highest clinical grades (1 and 2), compared with 4 of 17 in the control group. This considerable difference between the effects of the two treatments, when the proportion of patients free from any serious degree of bronchial obstruction is considered, remains evident at all later stages of the fortnight trial period; even though the numbers are small the difference is technically significant from day 4 onwards. At the end of the period 11 of 15 patients (2 of 3 males and 9 of 12 females) have achieved complete freedom from their attack of asthma on cortisone plus standard treatment, whereas only 4 of 17 (1 of 8 males and 3 of 9 females) have done so on the combination of standard treatment and placebo tablets.

The final two columns of table II record the number of patients removed from the trial either because of treatment changes (i.e., stopping of cortisone or placebo tablets) or death. Treatment was changed in 5 patients in the control group and in 1 cortisone patient. The single death during the first 14 days occurred in a patient receiving cortisone. Notes from the case-histories of the patients concerned are given below:

Death

Cortisone:

1. Male, aged 47 years, cough since pertussis at one year, asthma since early childhood, 3–4 attacks a year lasting 2–7 days, present attack began 8 days before admission, no benefit from tablets, overwhelming infective element present, died day 4, necropsy showed bronchiectasis, bronchopneumonia, and cor pulmonale.

Treatment Changes

Cortisone:

1. Female, aged 54 years, asthma 7 years, mitral stenosis with no history of rheumatic fever, mild degree of heart-failure 1 year ago, present attack began 14 days before admission. *On admission* liver palpable but no suggestion of heart-failure. Digitalis and penicillin given prophylactically. Asthma improved after 3 days, but œdema and auricular fibrillation appeared. By day 6 liver was enlarged and patient had ascites. Tablets withheld. Three months later patient was readmitted from convalescence in severe status asthmaticus and died in spite of corticotrophin therapy. Necropsy showed death to be due to status asthmaticus, chronic bronchitis and emphysema, and mitral stenosis.

Control

1. Male, aged 54 years, asthma 2 years, present attack 3 weeks, condition desperate on day 1, and it was feared patient might die. Changed to cortisone with good response.

2. Male, aged 47 years, asthma 3 years, present attack 1 week before admission, trial discontinued during day 2 because of failure of patient to respond to treatment. Constantly passing into clinical grade 5 and eventually being maintained thus. Corticotrophin gel given with excellent effect.

3. Female, aged 60 years, asthma 10 years, present attack 2 weeks, no response to tablets. Deterioration of condition led to treatment with corticotrophin on day 6. Rapidly improved.

4. Male, aged 47 years, asthma 10 months, present attack 2 days. After 9 days was showing no benefit from treatment, was becoming desperately ill, and was given corticotrophin. Made a dramatic recovery but relapsed later.

5. Female, aged 53 years, asthma 20 years, present attack 7 months. By day 10 patient had become very exhausted and was threatening to leave hospital. Cortisone given and patient improved.

TABLE II—NUMBER OF PATIENTS WITH GIVEN CLINICAL GRADES AT DIFFERENT POINTS OF TREATMENT

Time of assessment	Treatment group	Clinical grade*					Treatment discontinued or changed	Deaths
		1	2	3	4	5		
Day 0:								
1st 12 hr.	Cortisone	..	..	..	7	8	..	..
	Control	..	..	..	*11*	*6*	..	..
2nd 12 hr.	Cortisone	..	..	..	7	8	..	..
	Control	..	..	..	*14*	*3*	..	..
Day 1:								
1st 12 hr.	Cortisone	..	..	3	7	5	..	..
	Control	..	*2*	*2*	*11*	*2*	..	..
2nd 12 hr.	Cortisone	..	1	8	3	3	..	..
	Control	..	*3*	*1*	*10*	*3*	..	..
Day 2 ..	Cortisone	2	3	4	4	2	..	..
	Control	..	*1*	*6*	*6*	*3*	*1*	..
Day 4 ..	Cortisone	4	6	3	1	..	..	1
	Control	..	*4*	*5*	*5*	*1*	*2*	..
Day 6 ..	Cortisone	8	2	3	1	..	..	1
	Control	*3*	..	*7*	*4*	..	*3*	..
Day 8 ..	Cortisone	9	3	..	1	..	1	1
	Control	*3*	..	*5*	*6*	..	*3*	..
Day 10 ..	Cortisone	9	3	1	..	..	1	1
	Control	*3*	*2*	*6*	*2*	..	*4*	..
Day 14 ..	Cortisone	11	..	2	..	..	1	1
	Control	*4*	*1*	*4*	*3*	..	*5*	..

Clinical grades:
Grade 1: no clinical evidence of bronchial obstruction.
Grade 2: able to get about, wheezing audible only on auscultation.
Grade 3: patient comfortable in bed, wheezing respiration heard at bedside.
Grade 4: wheezing respiration, accessory muscles in use, discomfort intermediate between grades 3 and 5.
Grade 5: severe distress, able to talk only in gasps.

TABLE III—TEMPERATURE, RESPIRATION, AND PULSE-RATE

Day of trial	No. of patients with temp. above 99°F		No. of patients with resp. rate greater than 25 per min.		No. of patients with pulse-rate greater than 100		No. of "failures"—i.e., deaths and treatment changes	
	Cortisone	Control	Cortisone	Control	Cortisone	Control	Cortisone	Control
Day 0:								
1st 12 hours ..	1	2	10	8	12	15	..	..
2nd 12 hours..	3	4	12	10	12	12	..	..
Day 1:								
1st 12 hours ..	2	2	7	11	11	13	..	..
2nd 12 hours..	3	4	8	9	12	12	..	..
Day 2	4	5	3	9	10	11	..	1
Day 4	2	2	2	6	5	10	1	2
Day 6	1	2	0	6	1	9	1	3
Day 8	0	2	1	4	0	11	2	3
Day 10	0	1	0	3	1	6	2	4
Day 14	0	0	0	1	1	5	2	5

It should be noted that each of the 5 patients who did not respond to the control treatment showed considerable, even dramatic, improvement under treatment with either cortisone or corticotrophin. In addition, 2 of the 3 control patients who were still in clinical grade 4 at the end of the trial period were recorded as having received cortisone and corticotrophin immediately afterwards (day 15), and again both patients showed a good response to hormone therapy. Thus there were 7 control patients who failed to make any worthwhile response to their allocated treatment but showed a rapid and substantial improvement on being changed to treatment with either cortisone or corticotrophin.

Temperature, Respiration, and Pulse-rate

The assessment presented for each of these three characteristics is the number of patients with recordings above an arbitrarily chosen level at different stages of the trial (table III). Few patients experienced any rise of temperature, and there is little evidence of any difference between the cortisone and control patients. For both respiration and pulse-rate, however, it is evident that the cortisone group have the more favourable experience. The numbers of patients with a respiration-rate greater than 25 a minute before treatment and during the first day of the trial are closely similar in the two groups. On day 2 the cortisone group show a comparatively sharp decrease in this respect, and by day 6 all in the group have respiratory rates lower than the level chosen for assessment. Among the control group, on the other hand, the decline is delayed and more gradual, and on days 6, 8, and 10 there remain 6, 4, and 3 patients respectively whose respiration-rates are above 25 a minute. A similar pattern is displayed by the column giving numbers of patients with a pulse-rate greater than 100. The number of cortisone patients remaining in this category declines considerably on day 4, and by day 8 pulse-rates of all patients in the group are below 100, whereas 11 of the control patients still have pulse-rates above this level.

The final column repeats the number of patients who, having been removed from the trial by death or treatment change, were excluded from the assessments at various stages. These patients were those showing little or no response to treatment, and control patients predominate among the group. It therefore seems likely that, had it been possible, their continued inclusion would, if any-

TABLE IV—STANDARD THERAPY RECEIVED BY PATIENTS IN CORTISONE AND CONTROL GROUPS AT DIFFERENT STAGES OF TRIAL

Day of trial	No. of patients receiving antispasmodics		No. of patients receiving oxygen		No. of patients receiving sedatives		No. of "failures"—i.e., deaths and treatment changes	
	Cortisone	Control	Cortisone	Control	Cortisone	Control	Cortisone	Control
0	15	17	9	3	13	12	..	..
1	12	13	6	4	10	11	..	..
2	10	9	4	2	10	9	..	1
4	7	8	1	2	7	9	1	2
6	4	8	1	1	8	8	1	3
8	3	8	0	0	7	7	2	3
10	2	5	0	0	5	6	2	4
14	3	5	0	0	5	4	2	5

thing, have increased the differences noted between the two treatments.

Standard Therapy

The numbers of patients receiving antispasmodics, oxygen, and sedatives are given separately and for different times in table IV. All the patients received antispasmodic drugs on the day before treatment with the trial tablets was started, and there is a successive decline therafter in the numbers requiring them. The cortisone group again show an advantage in this respect, and by the end of the first week only 3, compared with 8 control patients, are receiving antispasmodics. The control group shows some subsequent improvement, and by day 14 the numbers are 3 and 5 respectively.

The experience of the two treatment groups as regards the number of patients receiving either oxygen or sedatives was very similar at all stages of the trial.

Follow-up

There was no evidence at follow-up three months later, available for 11 cortisone and 14 control patients, that cortisone therapy had decreased the chances of a subsequent attack of status asthmaticus. Of the patients followed up 9 in the cortisone group and 7 in the control group were recorded as having further attacks. The chronic asthma of both the remaining cortisone patients was said to be better compared with its state before the trial, whereas the comparable assessments in the other 7 control patients were 3 better, 3 with no change, and 1 worse.

Discussion

The results of the trial show clearly that in this group of patients in status asthmaticus, in whom treatment with the usual antispasmodic drugs for 24 hours had failed to produce relief, cortisone in the dosage used is effective treatment. By day 4 of treatment 10 of the 15 patients treated with cortisone no longer had disabling bronchial obstruction, whereas only 4 of the 17 control patients were in this satisfactory condition. This difference between the two groups was maintained to the end of the 14-day period of treatment.

It had been agreed, before the trial began, that any patient whose condition caused serious concern should be withdrawn from the trial and treated by any method which the clinicians thought advisable. It is interesting and supports the general result that 5 patients were withdrawn from the trial because they were not doing well and were all effectively treated with either cortisone or corticotrophin. These patients were, in fact, in the control group, although this was not known to the clinicians in charge of their treatment.

The 1 patient having cortisone who was withdrawn from the trial had mitral stenosis and developed signs of cardiac failure on day 6 of the trial. During the trial there was 1 death of a patient in the cortisone group. He was a middle-aged man who had had asthma for many years and had considerable bronchial infection and bronchopneumonia. The results of treating these 2 patients emphasise two of the difficulties of cortisone treatment: the danger of precipitating cardiac failure, especially in patients who are known to have had it previously; and the possibility that, in patients with severe bronchial infection, the treatment will not be effective and may be dangerous.

One of the interesting features of the trial was the relatively small numbers of patients who were admitted to it at each of the centres which took part. This was the result of the decision that all patients should first be treated with antispasmodic drugs according to the usual method of the clinician in charge. Only when these methods failed after being used for 24 hours was the patient accepted for the trial. In fact, in the majority of patients this "standard" treatment was successful, and after 24 hours of it the patients were no longer in status asthmaticus and so were not admitted to the trial. Because of the dangers and difficulties of cortisone treatment it should be used only after other methods have been tried vigorously and have failed. Except for the occasional patient who is extremely exhausted and dehydrated it seems advisable and satisfactory to use first of all treatment with antispasmodic drugs.

Observation of patients over a period of three months after the conclusion of the trial showed that most reverted to their usual asthmatic condition, and that the period of cortisone treatment did not prevent this. This is in agreement with the findings of other authors (Davies and Williams 1955). As regards recurrence of attacks of status asthmaticus, it is worthy of comment that 9 out of 11 patients in the cortisone group had further attacks in the three months after the trial, whereas in the control group 7 out of 14 had further attacks.

Summary

A comparison is made between the results of treating patients in status asthmaticus with antispasmodic drugs alone and with cortisone in addition to antispasmodic drugs.

All the patients were first treated for 24 hours with antispasmodics, and only those who were still in status asthmaticus were admitted to the trial.

32 patients in twelve hospitals were admitted to the trial, of whom 15 were in the cortisone group and 17 in the control group.

The patients in the cortisone group were without doubt more effectively treated than the others. By the 4th day 10 of the 15 patients treated with cortisone no longer had disabling bronchial obstruction, whereas only 4 of 17 in the control group were as well as this. At the end of the 14-day period 11 of 15 in the cortisone group, but only 4 of 17 in the control group, were free from bronchial obstruction.

Observation of the patients for three months after the trial showed that those in both groups reverted to their usual asthmatic condition; and attacks of status asthmaticus recurred in 9 out of 11 patients in the cortisone group and in 7 out of 14 in the control group.

We wish to thank the physicians who referred cases for inclusion in the trial, and Messrs. Roussel Laboratories Limited, who very generously provided the large number of placebo tablets.

REFERENCES

Ball, K. (1954) *Lancet*, i, 1162.
Carryer, H. M., Koelsche, G. A., Prickman, L. E., Maytum, C. K., Lake, C. F., Williams, H. L. (1950) *Proc. Mayo Clin.* **25**, 482.
Davies, B. M., Williams, D. A. (1955) *Brit. med. J.* ii, 293.
Medical Research Council (1956) *Lancet*, ii, 798.
Pearson, J. E. G. (1955) *Brit. med. J.* i, 189.

CHRONIC ASTHMA TREATED WITH AEROSOL HYDROCORTISONE

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IT has been reported (Foulds et al. 1955) that 11 of 15 asthmatics treated with inhalations of hydrocortisone powder 7·5–15·0 mg. daily showed definite improvement. The investigation unfortunately was not controlled blindly, a very necessary factor in any investigation of a new method of treating asthma. In previous blind trials of oral therapy we have obtained spectacular relief in chronic asthmatics given inert material.

We decided to test in a blind trial the results obtained by Foulds et al. The manufacturers supplied the necessary material for aerosol use; so our method of administration of the hydrocortisone was different and our results are in no way comparable with those of Foulds and his colleagues.

Hydrocortisone hemisuccinate was supplied as a powder in vials each containing the equivalent of 100 mg. of hydrocortisone base. This, when reconstituted with 2 ml. of a special diluent, made a solution stable for seven days only. It was a week's supply for one patient, providing a daily dose of a shade less than 15 mg.

The diluent consisted of sterile water and chlorobutanol as a preservative, with 0·1% 'Triton,' described as a safe non-toxic surfactant. The placebo consisted of lactose powder diluted in similar fashion.

Since the week's supply of 2 ml. had to be used in full, it was necessary to find a suitable inhaler which could be evacuated to about the last drop and in which the quantity of fluid could be easily seen and assessed. Eventually we found the standard 'Dritax' inhaler satisfactory. The whole 2 ml. was emptied into the inhaler, and three sharp squeezes of the rubber bulb thrice daily were roughly adequate; but each patient was told to watch the amount of fluid to make certain it was not being used too quickly.

The main disadvantage of the method was that patients had to return weekly to obtain a fresh solution. Each patient was treated for ten weeks and observed for a further month after the trial inhalations had ceased. All the patients were chronic non-seasonal asthmatics using much antispasmodic material. They were allowed to continue with this but were instructed to keep a daily diary of treatment used and the number of spasms.

Progress was assessed according to the lessening of attacks in duration and frequency; the lessening of the need for antispasmodic material; and improving health and mobility.

The trial was strictly blind. No-one knew what was in each vial until information arrived from America at the end of the trial and the key was opened. This did not take place until the full period of treatment for the last patient had ended and each patient had been classified.

Of the 9 patients who received the hydrocortisone 6 were no better, 2 had improved slightly, and 1 was much improved.

Of the 9 patients who received the inert material 4 were no better, 2 had improved slightly, and 3 were much improved.

Conclusions

The fact that better results were obtained with the inert material suggests that hydrocortisone is useless in chronic asthma when administered as an aerosol inhalation. (There is evidence from Foulds et al. [1955] that it may be effective inhaled as a powder. We are now investigating this in a blind trial.)

This trial underlies once more the necessity for investigating new forms of treatment for asthma by the blind method if reliable deductions are to be made.

We are very grateful to the Upjohn Company of America for providing the necessary material.

REFERENCE

Foulds, W. S., Greaves, D. P., Herxheimer, H., Kingdom, L. G (1955) *Lancet*, i, 234.

ABSORPTION OF INHALED HYDROCORTISONE

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IN 1955 Foulds, Greaves, Herxheimer, and Kingdom reported that inhalations of hydrocortisone were of value in the treatment of some asthmatic patients. It therefore seemed of interest to establish whether inhaled hydrocortisone could reach the circulation and give rise to systemic effects. We have estimated the total urinary 17-hydroxycorticosteroids before and after inhalation of hydrocortisone or formolised starch powder (as a control) by two normal male subjects. We found that inhalation of hydrocortisone was followed by an increase in the urinary excretion of 17-hydroxycorticosteroids.

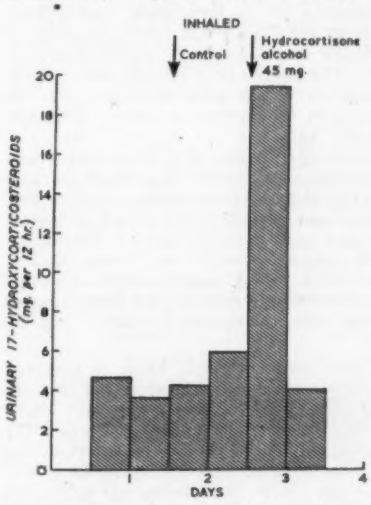

Fig. 1—Subject I: urinary excretion of 17-hydroxycorticosteroids.

Methods

Hydrocortisone alcohol and hydrocortisone acetate, both with mean particle sizes less than 5 μ diameter, were supplied by the Upjohn Company in capsules containing 15 mg. of active material. Apparently identical control capsules were filled with formolised starch powder. The test materials were inhaled from a powder spray held in the mouth during deep inspiration. Two to three hours were taken to inhale 45 mg. of hydrocortisone or the contents of three control capsules, and all the inhalations were carried out at the same time of day. Tablets of hydrocortisone acetate (20 mg.) were used for oral administration in one experiment.

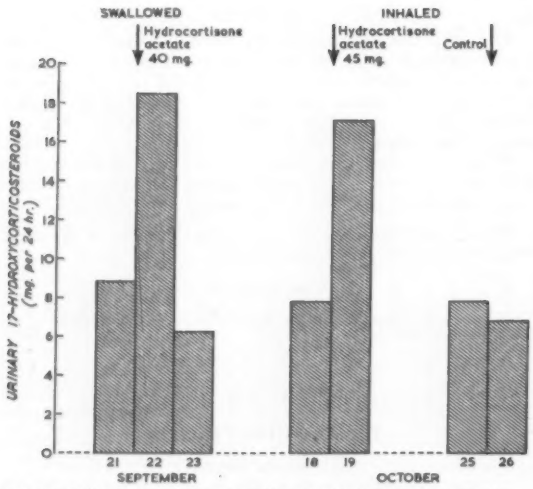

Fig. 2—Subject 2: urinary excretion of 17-hydroxycorticosteroids.

The urinary 17-hydroxycorticosteroids were estimated essentially by the method of Appleby et al. (1955). Androsterone was used as our standard reference compound in the estimation of 17-ketosteroids by the Zimmerman reaction. Amounts of urinary 17-hydroxycorticosteroids are reported here without correction for the differing chromogenic activities of the various steroids in preparations from urine.

Results

Our results are shown in figs. 1 and 2. In subject 1 the urinary excretion of 17-hydroxycorticosteroids was measured over consecutive twelve-hour periods before and after the inhalation of (1) formolised starch from three control capsules and (2) 45 mg. of hydrocortisone alcohol. The urinary excretion of 17-hydroxycorticosteroids increased in the twelve-hour period immediately following the inhalation of the hydrocortisone, but no change was observed in the amount excreted after the control inhalation (fig. 1).

In subject 2 the urinary excretion of 17-hydroxycorticosteroids was measured over twenty-four-hour periods before and after (1) 40 mg. of hydrocortisone acetate had been taken by mouth and swallowed, (2) 45 mg. of hydrocortisone acetate had been inhaled, and (3) formolised starch from three control capsules had been inhaled. The urinary excretion of 17-hydroxycorticosteroids increased after hydrocortisone acetate had been inhaled or swallowed but not after the control inhalation (fig. 2).

Discussion

Urinary 17-hydroxycorticosteroids may be derived either from endogenous adrenocortical secretion or from exogenous sources. One would expect administration of hydrocortisone to depress rather than increase the activity of the adrenal cortex, and it is unlikely that inhalation of hydrocortisone stimulates the cortex when inhalation of formolised starch does not do so. Hence our finding of increased urinary secretion of 17-hydroxycorticosteroids after inhalation of hydrocortisone suggests that hydrocortisone given in this way is absorbed into the systemic circulation. We do not know whether any of the inhaled material reached distal parts of the bronchial tree, and we have no evidence of the site of absorption of hydrocortisone. Mouth washings after inhalation of 45 mg. of hydrocortisone in one subject contained only 0·7 mg. of 17-hydroxycorticosteroids; so it is probable that most of the inhaled material passed beyond the oropharynx. A proportion of the powder may have been trapped in bronchial mucus, carried up into the pharynx, swallowed, and absorbed from the gut. We tried to assess the importance of this factor by studies in two patients with permanent tracheotomy openings after total laryngectomy. No conclusions could be drawn from these experiments, because inhalations of the hydrocortisone powder provoked coughing and increased flow of mucus from the tracheotomy openings, and we doubt whether significant amounts of hydrocortisone reached distal parts of the bronchial trees of these patients.

Conclusions

Our observation of increased urinary excretion of 17-hydroxycorticosteroids after the inhalation of hydrocortisone alcohol or of hydrocortisone acetate (not reproduced after control inhalation of formolised starch powder) suggests that hydrocortisone, in particles 5 μ mean diameter, is absorbed systemically when inhaled from a powder spray. It therefore seems possible that hydrocortisone inhalations could give rise to unwanted systemic effects.

This work was done at the suggestion of Dr. H. Herxheimer. We are especially grateful to Prof. R. S. Pilcher for his encouragement and provision of laboratory facilities in the surgical unit at University College Hospital Medical School. The Upjohn Company gave the hydrocortisone and powder sprays and met the expense of the project by a grant. Professor Pilcher and Mr. M. L. Formby kindly allowed us access to patients under their care. We gratefully acknowledge a gift of androsterone from the Clinical Endocrinology Committee of the Medical Research Council.

REFERENCES

Appleby, J. I., Gibson, G., Norymberski, J. K., Stubbs, R. D. (1955) *Biochem. J.* **60**, 453.
Foulds, W. S., Greaves, D. P., Herxheimer, H., Kingdom, L. G. (1955) *Lancet*, i, 234.

LUPUS VULGARIS TREATED WITH ISONIAZID

PRESENT STATUS OF THE DISEASE

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FOUR years have now elapsed since we began to use isoniazid (isonicotinic acid hydrazide) in the treatment of lupus vulgaris. Three years ago we published a preliminary report (Russell et al. 1953).

Of the 302 patients who have attended the lupus clinic at the London Hospital during these four years, 191 have required no treatment, because their disease was clinically healed; but the remaining 111, with active lesions, have been treated with isoniazid and occasionally also in other ways. In this paper the efficiency of isoniazid is compared with that of past methods for the control of lupus, and the present status of lupus as a public-health problem is compared with that of past decades.

Material

Sex, Age, and Previous Treatment

Our 111 patients were 40 males and 71 females between 8 and 82 years of age. 5 had had no antituberculous treatment for lupus; 94 had previously been treated with the Finsen-Lomholt lamp or with the Kromayer lamp, and 74 with calciferol orally (12 receiving two long courses, and 2 three or more courses). In 27 cases X rays or radium had been applied, during the early part of the century, to some of the affected areas.

Tuberculosis in Other Organs

The chests of 54 of the 111 patients had been radiographed. 10 showed scarring due to tuberculosis, and there were 3 females with active pulmonary tuberculosis.

One of them, aged 42, developed pulmonary tuberculosis before the successful treatment of her lupus with isoniazid. After six months' chemotherapy with streptomycin and isoniazid a cavity persists in one lung, and tubercle bacilli are present in the sputum, but the lupus has remained soundly healed.

The second, aged 54, has had bilateral apical tuberculosis for eight years. After treatment with *p*-aminosalicylic acid and streptomycin the pulmonary lesions became inactive two years ago, but the lupus, though slowly improving, did not clear. Isoniazid was then given for forty-one weeks, and the lupus cleared clinically.

The third, aged 37, whose lupus was successfully treated with isoniazid, later developed cavities in the apices of both lungs. The pulmonary tuberculosis has become quiescent after sanatorium treatment, including streptomycin, *p*-aminosalicylic acid, and isoniazid, and her lupus remains clinically inactive.

7 patients had previously had tuberculosis in organs other than the lungs.

Of 2 men who had had nephrectomies for tuberculosis of the kidney, 1 later developed several patches of lupus at different sites, including the operation scar.

2 women had had tuberculous adenitis (1 cervical, 1 mesenteric).

One man had an old healed tuberculous arthritis of the knee. Another man and a woman each had Pott's disease of the spine and ankylosis of an elbow-joint due to tuberculosis. The man also had a healed tuberculosis of the carpus.

Non-cutaneous non-pulmonary tuberculosis did not develop in any patient during the course of treatment with isoniazid.

We have not seen lupus vulgaris develop after B.C.G. vaccination. Marcussen (1954) reports 3 cases and mentions 3 others previously reported.

Lupus-carcinoma and Lupus-sarcoma

Of the 302 patients, 6 (3 males and 3 females) developed squamous epitheliomata on sites of lupus treated many years before with X rays. These were successfully treated by surgery (Mr. Charles Heanley) or by radiotherapy (Dr. G. Boden and Dr. W. Shanks). One patient developed a fibrosarcoma of the nose in an area of lupus which had formerly been treated with X rays: a successful excision and skin-graft were done by Mr. Heanley.

2 women had both neglected to seek treatment for extensive lupus of the face for over thirty years. They attended with deeply ulcerating and infiltrating epitheliomata which were too extensive for surgical treatment and proved resistant to X rays. Both died within six months, although in each case the lupus was responding satisfactorily to isoniazid.

Duration of Lupus

The duration of the lupus in the 111 patients had been:

Males	*Females*	*Total*
9–68 yr. (mean: 39 yr.)	6–74 yr. (mean: 34 yr.)	6–74 yr. (mean: 37 yr.)

Ages of Patients Today and at Onset of Lupus

Table I shows, for the entire series of 302 cases, the present ages of the patients and their ages at the time of onset of the lupus.

The age at onset was under 5 years in 31 (28%), under 10 in 54 (49%), under 15 in 78 (70%), and under 20 in 90 (81%).

TABLE I—AGE AT ONSET, AND PRESENT AGE, IN 302 CASES ATTENDING CLINIC

Ages at onset of lupus (yr.) (active cases only)	Males (1–55)	Females (2–51)	Total (1–55)	Ages today (yr.) (all cases)	Active cases	Healed cases	Total
Up to 5	11	20	31	Up to 5	0	0	0
6–15	15	32	47	6–15	2	19	21
16–25	10	7	17	16–25	2	6	8
26–35	2	2	4	26–35	11	19	30
36–45	1	6	7	36–45	23	3	26
46–55	1	4	5	46–55	32	47	79
56–65	0	0	0	56–65	26	45	71
66–75	0	0	0	66–75	10	41	51
76–85	0	0	0	76–85	5	9	14
Over 85	0	0	0	Over 85	0	2	2
Total	40	71	111		111	191	302

Treatment

Of the 111 patients treated with isoniazid, 1 received the drug by local injections only, and 8 were treated both locally and orally. Injection was later abandoned, except in special circumstances, because its disadvantages outweigh its advantages. With calciferol, a toxic drug, the situation is different, because the local method makes it possible to treat the lesion with a much smaller dose than would be necessary by the oral route (Russell 1951). As isoniazid is remarkably non-toxic its injection does not have this advantage; moreover injections are painful, which is important particularly with children. Patients treated by injections have to attend the clinic much more frequently than once a month, which is sufficient when the drug is taken by mouth. Oral treatment interferes very little with work or other activities.

The remaining 102 patients received isoniazid by mouth only; 9 of them also received calciferol orally for part of the time, and 2 were given some intralesional injections of calciferol.

We have no experience of the treatment of lupus vulgaris by the topical application of 5% isoniazid ointment. Harvey and Leslie (1955) claim good results in 5 of 6 patients treated in this way. After eight to ten weeks the lesions "practically disappeared."

We do not think it justifiable to give streptomycin with isoniazid, because the results obtained with isoniazid alone are consistently excellent. The risk of streptomycin intoxication is avoided, and the patient is saved the discomfort of many injections.

Dosage

Of the 104 patients who completed their treatment, 63 received 300 mg. of isoniazid daily in three doses of 100 mg. each, and 40 received 400 mg. daily in four doses of 100 mg. each. (1 patient received 150 mg. daily while we were observing the effects of local injections into one of her two lesions. Her dosage was later raised to 400 mg. daily.) A child, aged 8 years, was given 150 mg. daily. Doses above 400 mg. a day were never given.

Length of Course

Between six months and a year of continuous treatment was usually necessary to bring about clinical clearance of the lesions, but a shorter course was not necessarily followed by a relapse. Past experience with other treatments, including the Finsen-Lomholt lamp, has shown that treatment must be continued for some months after all clinical signs of activity have disappeared. In this series we have continued treatment for an average of fourteen weeks after apparent clinical clearance. Riehl and Köpf (1955) express the view that the course should comprise at least 1500 tablets (presumably they mean 100 mg. tablets, which would entail about a year's treatment at 400 mg. a day, or about one and a third years' treatment at 300 mg. a day).

Precautionary Isoniazid

A girl, aged 11 years, was given a course of isoniazid as a precautionary measure after clinical clearance of her lupus as a result of treatment with the Kromayer lamp.

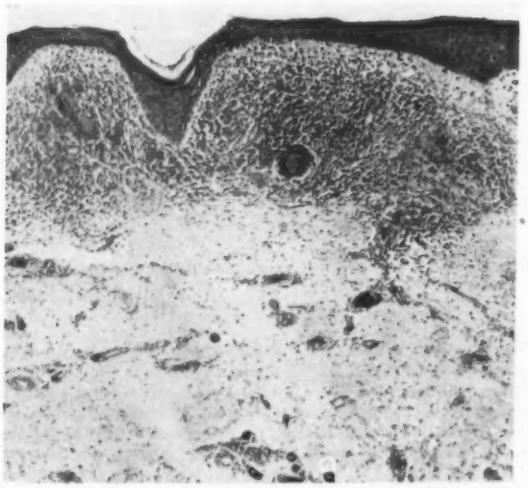

Fig. 1—Section from lesion before start of treatment with isoniazid.

Results

3 patients defaulted during treatment: after eleven, twenty-two, and sixty-six weeks.

When last examined, the first 2 were both responding satisfactorily to isoniazid. They did not reply to letters asking them to attend again. The 3rd patient took his tablets irregularly, defaulted for forty weeks, and still has active lesions. A 4th patient left the London area, but we have been informed that the lupus subsequently cleared on isoniazid.

3 women died while under treatment and while the skin lesions were responding satisfactorily to isoniazid. The death of 1 patient was due to bronchopneumonia, and the 2 others died from carcinoma superimposed on long-standing neglected lupus.

Complete clinical clearance took place in 99 patients in an average of twenty-nine weeks (males twenty-five weeks; females thirty-two weeks). The most rapid clearance was eight weeks, and the slowest seventy-nine weeks. In every case the isoniazid was continued for a further eight to sixteen weeks.

Only 1 child was treated, a boy aged 8 years, who was given 150 mg. a day for twenty weeks, with complete clinical clearance.

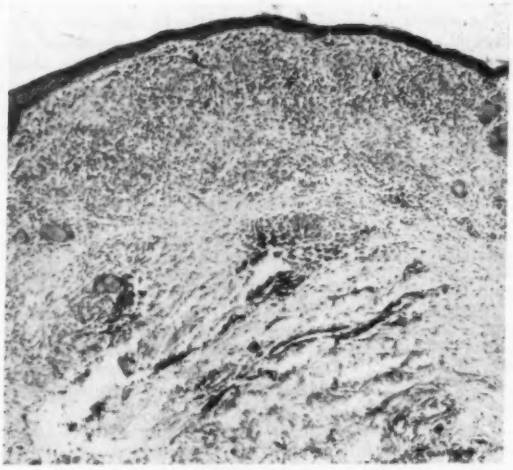

Fig. 2—Section from lesion after 4 weeks' treatment.

A woman, aged 56, had lupus in the skin of a lymphœdematous arm after mastectomy for mammary carcinoma and X-ray therapy to the axilla for lymphatic metastases. On a dose of 400 mg. a day the lesion became flatter after eleven weeks, less scaly at seventeen weeks, and clinically sound at thirty-seven weeks. Treatment has now been continued at 400 mg. a day for sixty-five weeks. This prolonged course seemed advisable because of the slower response, which we have attributed to the lymphœdema. We intend to continue treating this patient with isoniazid for eighty weeks.

The single patient who was treated by weekly intralesional injections of 100 mg. of isoniazid for twenty-six weeks has been kept under observation for a hundred and thirty weeks with no sign of relapse.

Plastic Surgery for Lupus and its Complications

The advent of isoniazid has made it possible for the surgeon to carry out plastic operations and to excise growths complicating lupus with greater confidence. The administration of isoniazid in full dosage both before and after the operation renders it most improbable that fresh tubercles will appear in the scar or in the grafted tissue. Mr. Charles Heanley has operated on 12 of our patients.

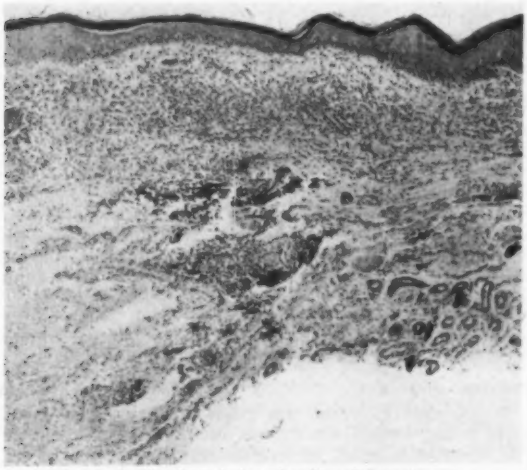

Fig. 3—Section from lesion after 8 weeks' treatment.

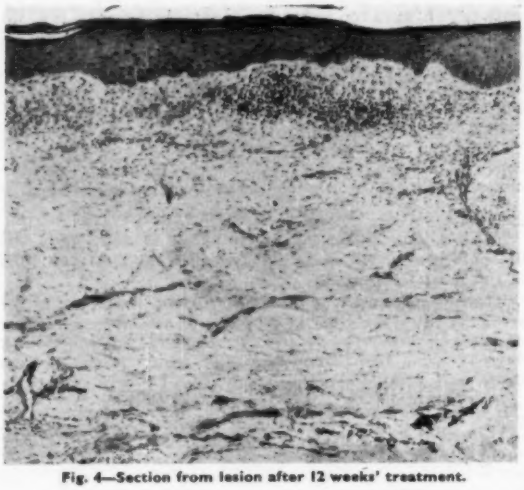

Fig. 4—Section from lesion after 12 weeks' treatment.

He has performed total rhinoplasty on 9 with great benefit to their morale. The operation was done for cosmetic reasons on 7 patients, there being ugly scarring, deformity, and loss of tissue. In 1 other patient a fibrosarcoma on the tip of the nose necessitated the operation. The 9th patient had a squamous horny carcinoma complicating his lupus. The growth involved the skin of the nose and upper lip. The nasal septum was also affected and was perforated. A fibrosarcoma was excised from the nose of another patient, without rhinoplasty. One patient had a recurrent carcinoma excised, the first operation having been five years before. One patient had a cheek rotation flap for an area of carcinoma superimposed on lupus.

Isoniazid is always given as a precaution, even when there has been no evidence of active lupus for many years. In no patient has there been a recurrence of lupus in the edge of the grafted area or in the graft itself.

Biopsies

Biopsies were rarely performed, the diagnosis being indubitable in most cases. A patient with extensive lesions gave permission for biopsies at intervals of a month on seven occasions. The tuberculous pattern of giant cells, epithelioid cells, and lymphocytes became non-specific after a few weeks. The epithelioid histiocytes and giant cells gradually disappeared, and the remaining non-specific infiltrate slowly became less conspicuous. Finally no histological abnormality could be observed, apart from atrophy due to the lupus. Fibrotic reactive changes, similar to those developing during the course of treatment with calciferol, were not seen (figs. 1–7).

Scars

The scars resulting from treatment with the Finsen-Lomholt lamp are usually smooth, supple, and white. With calciferol the tuberculous patch becomes fibrotic and thick. After treatment with isoniazid the affected area becomes of normal skin colour or slightly pigmented, with a reticular pattern and slight atrophy. Owing to this residual reticular pigmentation it is often difficult to decide the clinical end-point of resolution.

Intolerance and Toxicity

We have not seen any serious side-effects in any of our patients, perhaps because the dosage has always been kept below 6 mg. per kg. body-weight daily. 12 patients had transitory mild side-effects soon after treatment was started: 5 complained of nausea, dyspepsia, and constipation for a few days; 6 complained of giddiness, headache, and fatigue; and 1 had temporary anosmia. A nicotinic-acid-like effect of "burning feet" (Pegum 1952) has not been noted; nor have we seen disturbances of micturition (Krainin and Ney 1955). In our previous survey (Russell et al. 1953) 1 patient was reported to have urticaria, but this was later shown to have been due to injections for hay-fever.

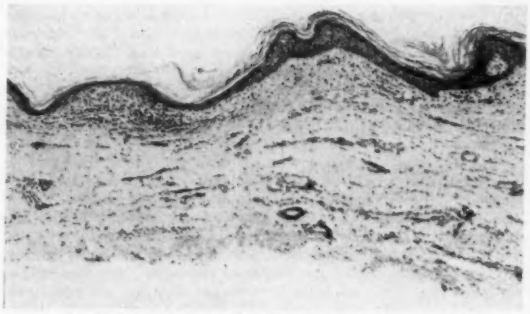

Fig. 5—Section from lesion after 16 weeks' treatment.

Isoniazid compares favourably with calciferol as regards tolerance and low toxicity. Feeny et al. (1947) reported 53% of patients with evidence of toxicity from calciferol and 23% who could not tolerate it. Some degree of toxicity has been regarded as an essential feature of treatment with calciferol.

Isoniazid in Pregnancy

Treatment was abandoned by 1 patient because of nausea in pregnancy. She gave birth to a stillborn anencephalic monster at thirty-nine weeks. She had taken isoniazid for twenty-three weeks during the pregnancy. We see no reason to relate the monstrosity to the treatment. Her lupus cleared after a further course of isoniazid, which began two weeks after the stillbirth.

Resistant Strains

The development of resistant strains of tubercle bacilli has been reported during treatment of pulmonary tuberculosis with isoniazid (Joiner et al. 1952). We have rarely seen this during the treatment of lupus vulgaris: clinical improvement has almost always continued steadily, even when treatment has had to continue for more than twelve months. 4 patients improved but failed to clear after prolonged treatment with isoniazid.

One of them improved for a while, and then the lesions became static and took on the clinical and histological appearance of lupus erythematosus. The residual condition of lupus

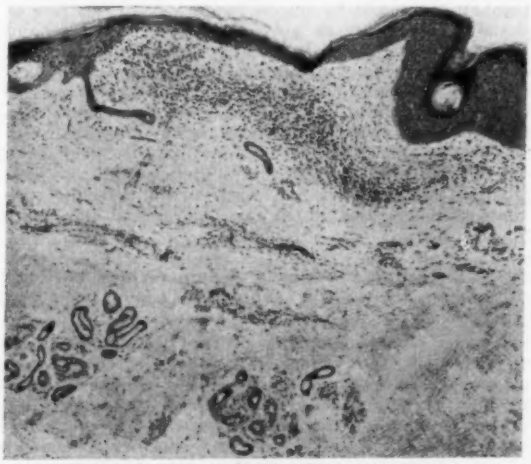

Fig. 6—Section from lesion after 20 weeks' treatment.

Fig. 7—Section from lesion after 33 weeks' treatment.

erythematosus resolved after treatment for seven weeks with chloroquine 300 mg. a day. We have seen a similar phenomenon in a woman whose lupus had been treated several years ago with the Finsen-Lomholt lamp and had finally cleared after treatment with isoniazid.

2 patients had several discrete, persistent nodules, after receiving 2464 and 1743 100-mg. tablets of isoniazid. The nodules responded to local injections of calciferol (Russell 1951).

The 4th patient was a woman with extensive lupus of the face and neck which had been untreated for more than thirty years. Clinical clearance took place in all the areas except the ear lobes and the lateral areas of the cheeks. These sites have proved equally resistant to combined oral treatment with calciferol and isoniazid and to treatment by general ultraviolet irradiation for eighteen months. She has refused to have any form of local treatment, and we are continuing to treat her with oral isoniazid. Her total dosage to date is 2750 100-mg. tablets.

Follow-up of Patients Treated with Isoniazid

Of the 99 patients who completed their courses of isoniazid and underwent clinical clearance 29 have been followed up for over two years, 46 for between one and two years, 12 for between six and twelve months, and 12 for less than six months.

Relapses

Relapses have occurred in 11 patients (5 males and 6 females). 5 had received 400 mg. a day, and 6 had received 300 mg. a day. Their courses averaged 796 100-mg. tablets, whereas the courses of those patients who so far have not relapsed have averaged 1086 100-mg. tablets. The recurrent nodules appeared between eight and a hundred and thirty weeks after completion of the course of treatment. 5 of these relapsed patients were successfully treated with local applications of acid nitrate of mercury bored into the nodules with a pointed wooden applicator. Intralesional injections of calciferol cleared up the relapse in 2 patients. Treatment by orally administered isoniazid is being repeated with 4 patients who have solitary or grouped recurrent nodules. Clinical clearance has taken place again in 2 of these patients, and the lesions of the other 2 patients are showing improvement.

Summary of Results

Table II analyses our series and the results obtained.

Isoniazid Compared with Past Methods of Treatment

Feeny et al. (1947) expressed the opinion that the introduction of calciferol made little if any difference to the 20% failure-rate resulting from treatment by general and local ultraviolet irradiation, which had been reported by Sequeira and O'Donovan (1927) and Lomholt (1934). Treatment with calciferol had the advantage that it was far easier to give and took less than half the time required by ultraviolet irradiation.

TABLE II—RESULTS

Patients attending lupus clinic		302
Patients with healed lesions from previous treatments		191
Patients with active lesions, starting treatment with isoniazid before July 1, 1955		111
Results:		
Clinically sound	99	
Resistant lesions	4	
Failed to attend	4	
Precautionary course	1	
Died	3	
Results in 4 resistant cases:		
Partial clearance with isoniazid; developed lupus erythematosus, which later cleared with chloroquine	1	
Cleared with intralesional injections of calciferol	2	
Resistant also to oral calciferol with isoniazid and to general ultraviolet irradiation	1	
Relapses (5 males and 6 females)	11	
Cleared with cauterisation by acid nitrate of mercury	5	
Cleared with local injections of calciferol	2	
Cleared with further course of isoniazid	2	
Lesions improving but still active during second course of isoniazid	2	
Patients whose lesions remain active after prescribed courses of isoniazid and supplementary treatments (1 resistant case, 2 relapse cases)	3	
Patients (excluding deaths, defaulters, precautionary case) with clinically healed lesions	100	(97·1%)

Feeny found 150 patients with active lesions in 350–400 patients attending the clinic in the few years preceding 1947. Some six to eight years later we found 111 patients with active lesions in 302 patients attending the clinic. After four years' treatment with isoniazid we have 12 patients with clinically active lesions among 296 patients now attending the clinic. They comprise:

Patients who have not previously been treated with isoniazid	6
Relapsed patients, undergoing a second course	2
Defaulters who have now returned for further treatment	3
Resistant patient who has rejected local treatment	1

It was noted with calciferol that the proportion of resistant and relapsed cases rose as time passed. Riehl and Köpf (1955) found that 74% of patients had clinically healed lesions after treatment for two years with calciferol. After 5 years only 60% remained clinically healed. As yet we see no sign of a similar increasing rate of relapse or resistance to isoniazid treatment.

It has not proved necessary to admit any of our patients to hospital during treatment. Like Riehl and Köpf (1955), we see no need, except in special circumstances, to alternate isoniazid with streptomycin, *p*-aminosalicylic acid, or any other antituberculous drug, as recommended by Dowling and Wetherley-Mein (1954).

Passing of Queen Alexandra Light Department

In 1903 King Edward and Queen Alexandra opened the new outpatient building at the London Hospital, including the Finsen Light Department in which Queen Alexandra took such a special interest. Under the guidance of Dr. J. H. Sequeira, Dr. W. J. O'Donovan, and Dr. A. Burrows, the department continued in active operation in peace-time and through two world wars. The introduction of calciferol reduced the volume of work considerably, and the introduction of isoniazid led to the virtual abandonment of actinotherapy for lupus. It has not proved necessary to use a Finsen-Lomholt lamp in the treatment of lupus since the spring of 1953, when the whole of the Queen Alexandra Light Department was converted into a new dermatological department, comprising 5 consulting-suites, treatment room, theatre, library, small laboratory, darkroom, and secretary's office. Two Finsen-Lomholt lamps have been held in reserve in the treatment room. We have not found it necessary to combine isoniazid treatment with any form of local treatment as a routine. The Finsen-Lomholt lamp, the Kromayer lamp, and applications of picric-brass paste, as advocated by Dowling and Wetherley-Mein (1954), have not been used. Occasionally we use acid nitrate of mercury to destroy solitary nodules.

All the treatment of patients with lupus, previously so tedious and painful, can now be given in comfort at a weekly clinic. All the patients are followed up indefinitely. A skin-cancer follow-up clinic is held at a different hour on the same morning, and of late we have found it convenient to see many of our patients with lupus erythematosus on the same morning as those with lupus vulgaris.

Declining Prevalence of Lupus Vulgaris

Our 111 patients with active lupus had had it for an average of thirty-seven years (see above)—an impressive indication of the chronicity of this disease and of its intractability and tendency to recur after apparent clearance. Figures given above also indicate the tendency for lupus to make its first appearance in childhood (70% of our patients with active lesions were affected before the age of 16), and the remarkable decline in the incidence of lupus from a maximum in those born 46–55 years ago

(1901–10) to a figure one-tenth the size in those born 16–25 years ago (1931–40), followed by a slightly increased prevalence in those born 6–15 years ago (1941–50).

A relative increase of pulmonary tuberculosis in older age-groups was noted before the second world war, and Frost (1939) pointed out that these higher rates in later life were the residuals of higher rates in earlier life. With lupus, the cohorts (survivors at any age of all persons born in a given year or group of years) up to and including the 1901–10 cohort contain a higher rate of affected individuals than do the cohorts from 1911–20 onwards.

In lupus the preventive measures operate mostly on people under 20 years of age. So long as these measures continue to operate (Springett 1950), the average age of affected persons will continue to rise.

Several factors have probably been responsible for the decline of lupus. Modern methods of securing clean milk have certainly been the most important. Griffith (1937) published figures from several sources indicating that in England 58·4% of lupus patients under 5 years of age were infected with bovine type of tubercle bacilli and 44·4% of those between 5 and 15 years of age. For all age-groups the percentage was 48·7. In Scotland the comparable figures for a much smaller number of cases (13 against 191) were 100%, 71·4%, and 69·2%.

Several enactments between 1913 and 1937 encouraged the production of clean milk and uncontaminated meat, while other Acts assisted the early detection and treatment of pulmonary tuberculosis. Today the great bulk of the milk-supply of large cities and towns in Great Britain is pasteurised and delivered in efficiently sealed bottles. Better nutrition and better housing have also helped to reduce lupus.

We have not seen a case attributable to B.C.G. inoculation, tattooing, or abrasions received at swimming-baths (Hellerström 1951).

Other Forms of Cutaneous Tuberculosis

Apart from lupus we have treated 7 other patients with isoniazid.

Tuberculosis Verrucosa Cutis

A post-mortem attendant, aged 51, had developed a verruca necrogenica ten years before. It had cleared after treatment for six years with creosote and salicylic-acid plasters, ultra-violet irradiation, and calciferol by mouth. A second verruca necrogenica developed on another finger three years after the clearance of the first. This resolved after treatment for twelve weeks with isoniazid 300 mg. a day. There has been no sign of a recurrence during the past two and a half years.

Scrofulodermia

3 patients with scrofulodermia have been treated.

The first was a boy aged 8 years. His lesions resolved after treatment for thirty weeks with isoniazid 150 mg. daily. He has remained free from recurrence for two and a half years.

The second was a woman aged 35. Her condition cleared after six weeks' treatment with isoniazid 300 mg. a day. Treatment was continued for ten more weeks, and there has been no relapse during the subsequent twenty-six weeks.

The third patient, a woman aged 81, had suffered since the age of 50 from swellings of the lymph-nodes in the neck. She had been operated on, the glands had broken down, and there was a thin discharge from two sinuses. Another nodule appeared. It was opened, and tubercle bacilli were cultured from the pus. She was given isoniazid 300 mg. daily for a month and then 400 mg. a day. She then attended another centre to save herself unnecessary travelling. When seen again eight months after the treatment had been started, the sinuses had healed.

Erythema Induratum

2 patients with erythema induratum have been treated.

The first was a woman, aged 62, under the care of Dr. Theresa Kindler. All her lesions healed after twelve weeks' treatment with isoniazid 100 mg. daily. Two years later she had not relapsed.

The other patient was a woman, aged 32, who had developed erythema induratum a month after the drainage of a tuberculous abscess in the neck. Treatment was started with isoniazid 300 mg. daily, later increased to 400 mg. daily. The lesions were clinically sound after twenty weeks' treatment. Isoniazid was continued for thirteen more weeks, and the lesions have remained healed.

Lupus Miliaris Disseminatus Faciei (acnitis; acne agminata)

A woman, aged 46, who had had this condition for six years, was treated with calciferol and isoniazid, without demonstrable improvement. On the other hand, we have seen this condition undergo spontaneous resolution in another patient after antituberculous measures had failed. We do not believe that lupus miliaris disseminatus faciei is, in fact, a tuberculide.

Papulonecrotic Tuberculides

We have had no opportunity to treat papulonecrotic tuberculides with isoniazid. Lucius (1952) and Riehl (1953) have reported poor or inconclusive results, whereas Cormie et al. (1953), Costello (1954), Ihrke (1954), Marchioni et al. (1953), and Schoch (1952) have reported good results. Marchioni points out that it is difficult to assess isoniazid in this condition, because the lesions tend to recur in crops and to heal rapidly and spontaneously.

Summary

Results obtained with isoniazid in 111 cases of lupus vulgaris are reported after four years experience with the drug.

Improvement took place in all the 103 patients who completed the course of treatment, and in 99 of them the lesions were clinically cleared. In 3 of the others they have since cleared with other treatment, while the 4th has refused local treatments.

The 99 patients whose lesions cleared have been followed up for six to twenty-four months after the completion of their courses. Relapses (with solitary or grouped nodules) have occurred in 11, in whom the average length of treatment was thirty-two weeks and the average total dosage of isoniazid was 79·5 g. In the 88 patients who have not relapsed, the average length of treatment was forty-six weeks and the average total dosage was 108·5 g. 9 of the relapsed cases have cleared again with various treatments and 2 are improving on a second course of isoniazid.

For adults, it is advisable to give isoniazid in a dose of 300 mg. a day for a period extending up to at least three months after clinical clearance. This usually entails treatment for a year with a total dosage of about 110 g. but in selected cases a total of 150 g. may be thought necessary. A daily dose of 400 mg. has not brought about earlier clinical clearance.

The incidence of new cases of lupus vulgaris at the London Hospital has fallen remarkably in the last few decades. This is attributed to cleaner milk, earlier recognition and improved treatment of pulmonary tuberculosis, and better nutrition and housing.

Although about 85% of the patients in this review first developed lupus vulgaris before they were 25 years of age, fewer than 10% of those now attending the lupus clinic for treatment or follow-up are under that age.

Isoniazid proved effective in a case of tuberculosis verrucosa cutis, 3 cases of scrofulodermia, and 2 cases of erythema induratum, but improvement was not seen in a case of lupus miliaris disseminatus faciei.

We wish to thank Sister F. Taylor for her ready help in the collection of data for this paper. The photomicrographs were made by Mr. A. J. King, of the Bernhard Baron Institute of Pathology.

References overleaf

LONG-TERM CHEMOTHERAPY IN CHRONIC BRONCHITIS

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THE pathogenesis of chronic bronchitis involves many factors, one of which is infection. Although the part played by infection in the early stages of bronchitis has not been clearly assessed, no doubt it contributes very significantly to the symptoms and progressive deterioration of many established chronic bronchitics.

Many workers agree that the most important pathogenic bacteria involved in the infection are *Hæmophilus influenzæ* and the pneumococcus, indicating that chemotherapy, when required, should be directed against these two organisms (Mulder et al. 1952, May 1953a and b, 1954, Elmes et al. 1953, Stuart-Harris et al. 1953). The pneumococcus is always highly sensitive to penicillin, which readily destroys it, and pneumococcal infections seldom relapse quickly after penicillin treatment. *H. influenzæ*, however, is extremely difficult to eradicate with any antibiotic for more than short periods, once it has become established in the sputum, and prevention of the relapses of hæmophilus infections after therapy presents one of the problems of the treatment of advanced bronchitis (May 1953b, Knox et al. 1955). In addition, prevention of acute exacerbations of infection is of great importance, since each exacerbation probably adds its quota of irreparable damage to the lungs (Reid 1954).

Helm et al. (1954, 1956) have given oxytetracycline continuously to patients with advanced bronchitis for long periods to minimise the infection and its exacerbations. We report here our experiences of long-term treatment of 37 chronic bronchitics with oxytetracycline and tetracycline. In the early stages of bronchitis there is probably no need for continuous chemotherapy, since the exacerbations, which are infrequent, respond promptly to a combination of penicillin and streptomycin, and the remissions are complete. In the later stages, however, when there is much persistent ill health, particularly in winter, any remedy which can preserve reasonable health and minimise further damage to the lungs is worth trying. This is the type of case for which this trial was designed.

DR. RUSSELL, DR. THORNE: REFERENCES

Cormie, F. E., Costello, M. J., Barker, L. P., Nelson, C. T., Wilson E. W., Cramer, J. A. (1953) *Arch. Derm. Syph., Chicago*, **68**, 536.
Costello, M. J. (1954) *Ibid*, **70**, 246.
Dowling, G. B., Wetherley-Mein, G. (1954) *In* MacKenna, R. M. B. Modern Trends in Dermatology. London; p. 118.
Feeny, P. J., Sandiland, E. L., Franklin, L. M. (1947) *Lancet*, i, 1438.
Frost, W. H. (1939) *Amer. J. Hyg.* **30**, 91.
Griffith, A. S. (1937) *Tubercle*, **18**, 529.
Harvey, G., Leslie, G. (1955) *Brit. J. Derm.* **67**, 225.
Hellerström, S. (1951) *Acta derm. venereol.* **31**, 194.
Ihrke, R. E. (1954) *Arch. Derm. Syph., Chicago*, **69**, 753.
Joiner, C. L., MacLean, K. S., Pritchard, E. K., Anderson, K., Collard, P., King, M. B., Knox, R. (1952) *Lancet*, ii, 843.
Krainin, P., Ney, C. (1955) *New Engl. J. Med.* **253**, 1111.
Lomholt, S. (1934) *Brit. med. J.* ii, 291.
Lucius, K. (1952) *Z. Haut-Geschlechtskr.* **13**, 367.
Marchioni, A., Spier, H. W., Röckl, H. (1953) *Hautarzt*, **4**, 497.
Marcussen, P. V. (1954) *Brit. J. Derm.* **66**, 121.
Pegum, J. S. (1952) *Lancet*, ii, 536.
Riehl, G. (1953) *Hautarzt*, **4**, 108.
— Köpf, O. (1955) The Therapy of Skin Tuberculosis. Springfield, Ill.; p. 130.
Russell, B. (1951) *Arch. Derm. Syph., Chicago*, **64**, 676.
— Thorne, N. A., Grange, R. G. (1953) *Lancet*, i, 964.
Schoch, A. (1952) *Schweiz Z. Tuberk.* **9**, 281.
Sequeira, J. H., O'Donovan, W. J. (1927) *Lancet*, ii, 1118.
Springett, V. H. (1950) *J. Hyg., Camb.* **48**, 361.

Materials and Methods

Patients

The patients were all advanced chronic bronchitics attending the Bronchitis Clinic at the Brompton Hospital, London. There were 31 males and 6 females, aged 36–72. All had active infection, indicated by persistent pus in the sputum.

Assessment Groups

During six months of the winter of 1954–55 14 of the patients made daily observations on the volume and purulence of their sputum. The volumes were measured in calibrated glass jars, and the purulence was noted as "colour," which was checked at each monthly visit to the clinic. The amount of pus in the sputum was graded as follows: O, mucoid; +, about 25% pus; ++, about 50% pus; and +++, about 75% pus or more.

Bacteriological examination of the sputum of these patients showed that *H. influenzæ* was present persistently in every case. Treatment during the six months was entirely symptomatic, antibiotics being given only in short courses (not longer than a week) for acute exacerbations.

For six months during the winter of 1955–56 these 14 patients, together with the other 23 in the series, were given continuous chemotherapy. The daily volume of the sputum was not accurately measured; but, since the patients had had considerable previous experience in examining their sputum, their estimates of the daily volume were considered to be sufficiently reliable for the present purpose.

The 14 patients observed during both winters will be referred to as the "controlled group" and the remaining 23 as the "uncontrolled group." A direct comparison of the behaviour of the "controlled" patients in the two winters is justifiable because they were almost all Civil Servants, and there was significantly more sickness absence in the Civil Service from respiratory infections, including bronchitis, in the winter of 1955–56 than in 1954–55 (D. D. Reid, personal communication). Hence the contention that benefit apparently derived from continuous chemotherapy was in reality a result of more favourable climatic conditions in the winter of 1955–56 was not applicable.

Monthly Assessments

Each patient attended the clinic monthly throughout the period(s) of observation. Although a note was made of the patient's subjective impressions of the effect of the treatment, an attempt was made to assess the results mainly by objective measurements. The following points were noted:

(1) The daily volume and purulence of the sputum.

(2) The number, type and severity of acute exacerbations; an attempt being made particularly to determine whether or not each exacerbation was associated with bacterial infection—i.e., raised temperature and increased purulence of the sputum.

(3) The number of days off work because of the chest condition.

(4) The nature and severity of any side-effects of the treatment.

(5) The patient's assessment of his general health and the subjective effect of treatment on his dyspnœa.

Antibiotics and their Dosage

Since only oral antibiotics could be used in practice for long-term chemotherapy, the choice (dictated by the high prevalence of *H. influenzæ* infections) was limited to chloramphenicol and the tetracycline group. Because of the risk of causing blood dyscrasias, chloramphenicol was not used. Previous experience in this clinic of chlortetracycline in bronchitis has not been encouraging; so the antibiotics used in the investigation were limited to oxytetracycline and tetracycline. No routine dosage was

used, the dose being adjusted to the smallest amount that would maintain the sputum free from pus. In some instances it was necessary to reduce the dose to a lower level than was desirable, because the patient could not tolerate a larger amount. The choice between tetracycline and oxytetracycline was made according to the patient's ability to tolerate each drug—in some patients one drug caused severe diarrhœa, whereas the other produced no side-effects.

Bacteriological Examinations

Except for the routine monthly examinations of the sputum of the "controlled group" in the winter of 1954–55, regular bacteriological examinations were not made. A preliminary examination before treatment, however, showed that *H. influenzæ* was present in every patient in the "controlled group" and in 20 of 23 in the "uncontrolled group." In addition, specimens of sputum and nasal swabs were examined at intervals to determine the incidence of antibiotic-resistant staphylococci. All the cultures were made on blood-agar, sputum samples being first homogenised with pancreatin (Rawlins 1953). The antibiotic-sensitivity of staphylococci was tested by titration in nutrient broth.

Results

"Controlled Group"

The daily records of the quantity and purulence of the sputum of the 14 patients in this group during the control period provided a useful objective index of the behaviour of advanced bronchitics under "normal" conditions. Details of the findings for individual patients are shown in table I, but the pattern for all the patients was substantially constant. The volume and purulence of the sputum remained more or less unchanged throughout the period except during exacerbations, when there was an increase. The course of the exacerbations was similar in almost every case, starting with a cold in the head which rapidly "went down to the chest" and caused an increase in the amount and purulence of the sputum expectorated. There was usually some pyrexia. Treatment with penicillin and streptomycin usually reduced the volume and purulence of the sputum to an amount less than that before the exacerbation, but within a few days of stopping treatment these had returned to the previous level. The time lost from work during each exacerbation varied considerably with different patients, but the average for all exacerbations within the group, severe enough to cause the patient to stay away from work, was 13½ days.

The effects of continuous chemotherapy on these 14 patients are summarised in table I. 4 patients (cases 3, 7, 8, and 11) could not tolerate a large enough dose of either drug. Treatment was discontinued in case 7, who had severe diarrhœa when taking only 0·25 g. of oxytetracycline b.d. Cases 8 and 11 were much improved initially, but the dosage had to be reduced to a low level because of side-effects (one giddiness, the other flatulence), and the improvement was not maintained. Case 3 showed slight improvement at first on a dosage of 0·5 g. of tetracycline t.d.s. but relapsed rapidly when, because of diarrhœa, oxytetracycline was substituted and the dosage reduced to 0·5 g. b.d. Even on this dosage he still had some diarrhœa.

One patient (case 13) was quite unchanged at the end of six months' treatment with oxytetracycline 0·5 g. b.d., but he showed evidence of only slight infection, estimated by the degree of purulence of his sputum.

The responses of the remaining 9 patients were all judged to be good. With one exception (case 14) the daily volume of the sputum was reduced, and in every case the pus was either eliminated or much diminished. The number of attacks of acute bronchitis was reduced in 7 patients; case 6 had no attacks in either winter, although without treatment her general health was poor; and case 12 had one attack each winter, the attack while she was having treatment being very mild. Similarly, the number of days off work was reduced in 6 patients; of the other 3, case 5 was off mainly because of acute shortness of breath while having treatment, in contrast to acute bronchitis the previous winter; case 6 was not off work at all in either winter; and case 14 was off only 9 days and 14 days in the two winters. All 9 patients were insistent that "the tablets had given them the best winter for years."

TABLE I—RESPONSES OF CONTROLLED GROUP TO CONTINUOUS TETRACYCLINE OR OXYTETRACYCLINE THERAPY FOR 6 MONTHS

Case no.	Drug and dosage (g.)	Side-effects	Sputum (daily average)		Days off work	Attacks of acute bronchitis	Effect of treatment on		
			Vol. (fl. oz.)	Purulence			Infection	Dyspnœa	General health
1	c	..	2	+ + to + + +	118	6	..	..	..
	Ox. 0·5 t.d.s.	None	1¼	0 to +	71	0	Controlled	Less	Improved
2	c	..	1½	+ + to + + +	10	3	..	..	..
	T. 0·5 t.d.s.	None	1¼	0 to +	0	0	Controlled	Worse	Improved
3	c	..	½	+ + +	5	1	..	..	..
	Ox. 0·5 b.d.	Diarr. +	½	+ + +	0	1	Uncontrolled	Same	Same
4	c	..	1¼	0 to + +	29	8	..	..	..
	T. 0·25 t.d.s.	Diarr. +	1	0 to +	12	2	Controlled	Same	Improved
5	c	..	1¼	+ + to + + +	15	6	..	..	..
	T. 0·25 t.d.s.	None	½	0	21	1	Controlled	Worse	Improved
6	c	..	1	+ + +	0	0	..	..	..
	T. 0·25 t.d.s.	None	½	+	0	0	Controlled	Less	Improved
7	c	..	1¾	0 to +	13	4	..	..	..
	Ox. 0·25 b.d. (51 days only)	Diarr. + +	2	0	0 (51 days only observed)	0	Controlled	Same	Same
8	c	..	Tr.	+ + +	0	0	..	..	..
	Ox. 0·25 t.d.s.	Giddiness	Tr.	0 for 3 mos. then + + +	35	1	Initially controlled	Worse	Same
9	c	..	1¾	+ to + + +	116	7	..	..	..
	T. 0·25 b.d.	None	1	0	14	0	Controlled	Less	Improved
10	c	..	3¼	+ +	96	2	..	..	..
	T. 0·25 t.d.s.	None	1¼	0	0	1	Controlled	Same	Improved
11	c	..	1	+ +	37	4	..	..	..
	Ox. 0·25 b.d.	Flatus +	1½	0 for 3 mos. then + + +	7	2	Initially controlled	Same	Same
12	c	..	1	+ + +	59	1 (severe)	..	..	..
	T. 0·5 b.d.	None	½	0 to +	35	1 (mild)	Controlled	Worse	Improved
13	c	..	1½	+	12	1	..	..	..
	Ox. 0·5 b.d.	None	2	+	14	1	Uncontrolled	Same	Same
14	c	..	1	+ + to + + +	9	2	..	..	..
	T. 0·5 b.d.	Diarr. +	2¼	0	14	1	Controlled	Same	Improved

Drug and dosage, maintenance dose of best tolerated drug. c, control period. Ox., oxytetracycline. T, tetracycline.
Sputum purulence: 0, mucoid. +, about 25% pus. + +, about 50% pus. + + +, about 75% pus or more.
Side-effects refer to the maintenance dosage only.

TABLE II—RESPONSES OF UNCONTROLLED GROUP TO CONTINUOUS TETRACYCLINE OR OXYTETRACYCLINE THERAPY FOR 6 MONTHS

Case no.	Drug and dosage (g.)	Side-effects	Sputum (daily average) (fl. oz.)				Time off work	Clinical effect
			At start	After 1 mo.	After 6 mos.			
15	T. 0·25 t.d.s.	None	3 ++	3 0	3 +		Same	No change
16	T. 0·25 b.d.	None	1 +	1/2 0	1/2 0		Less	Improved
17	T. 0·25 b.d.	Diarr. +	1/4 ++	1/2 +	1/2 +		Same	No change
18	T. 0·25 daily	None	2 +++	1 0	1/2 0		Less	Improved
19	T. 0·25 t.d.s.	None	2 +	1 1/2 0	1 0		Same	No change
20	T. 0·5 b.d.	None	3 ++	1/2 0	1 0		Less	Improved
21	T. 0·5 b.d.	None	1 ++	1/2 0	Trace 0		Less	Improved
22	T. 0·25 b.d.	None	1 1/2 +++	1/2 0	1 0		Less	Improved
23	T. 0·5 b.d.	None	4 ++	2 0	2 0		Less	Improved
24	T. 0·25 b.d.	Diarr. +	2 ++	Trace 0	1 1/2 ++		Same	Improved for 4 mos.
25	Ox. 0·5 t.d.s.	None	3 ++	1 +	1/2 +		Same	No change
26	Ox. 0·5 t.d.s.	None	16 +++	8 +	8 +		Less	Improved
27	Nil	Diarr. ++ even on T. 0·25 g. b.d.	3/4 +	3/4 +	Stopped treatment		..	..
28	T. 0·5 b.d.	Diarr. +	1 ++	1/2 0	Trace 0		Less	Improved
29	T. 0·25 b.d.	None	1 ++	1/2 +	1/2 +		Less	Improved
30	Ox. 0·25 daily	Diarr. +	5 +	3 0	1 0		Less	Improved
31	T. 0·25 b.d.	None	2 ++	1/2 0	Trace 0		Less	Improved
32	T. 0·25 b.d.	Diarr. +	3 ++	1/2 +	1/2 0		Less	Improved
33	T. 0·5 b.d.	None	2 ++	2 0	2 0		Less	No change
34	Ox. 0·25 b.d.	Diarr. +	1/2 +	1/2 0	1/2 +		Less	No change
35	T. 0·25 b.d.	None	1 +	1/2 +	1/2 ++		Less	No change
36	T. 0·25 b.d.	Diarr. +	1 ++	2 1/2 ++	1/2 0		Same	No change
37	Ox. 0·5 b.d.	None	4 ++	2 0	1/2 0		Less	Improved

Drug and dosage, maintenance dosage of best tolerated drug. Ox., oxytetracycline. T, tetracycline.
Sputum purulence: 0, mucoid. +, about 25% pus. ++, about 50% pus. +++, about 75% pus or more.
Side-effects refer to maintenance dosage only.

"Uncontrolled Group"

Of the 23 patients without a control period of observation (table II) case 27 had to stop treatment because of diarrhœa. 7 others (cases 17, 24, 28, 30, 32, 34, and 36) required minimal dosage because of diarrhœa, but 3 of these (cases 28, 30, and 32) were nevertheless improved. Case 24 started treatment as an inpatient having tetracycline 1 g. t.d.s. This caused severe diarrhœa and necessitated reduction of the dosage to 0·25 g. b.d. Although he improved dramatically at first, his condition reverted to its original state soon after reduction of the dosage.

General improvement was noted in 10 of the 15 patients who had no side-effects from the drugs (cases 16, 18, 20–23, 26, 29, 31, and 37). In all of these 10 there was a reduction in sputum volume, sputum purulence, and time lost from work, and the patients were enthusiastic about the effect of the treatment on their general health.

The remaining 5 patients (cases 15, 19, 25, 33, and 35) were considered to have shown no over-all improvement with treatment. 4 of these (cases 15, 19, 25, and 33) showed reduced purulence of the sputum, but the patients themselves were not impressed.

Dosage and Side-effects of Antibiotics

The incidence of side-effects in both groups of patients, together with the over-all effects of treatment, are shown in table III. Of the 11 patients considered to show no over-all improvement 2 had to stop treatment because of severe diarrhœa. 4 other patients could not tolerate a dosage sufficiently large to cause improvement. The maintenance dosages of the 22 patients who benefited from the treatment are shown in table IV. About half the patients (12 of 22) were controlled by a total daily dosage of less than 1 g., whereas the remainder required 1·0–1·5 g. daily. No distinction is made in the table between the patients taking tetracycline and those taking oxytetracycline, since there appeared to be no difference between the two drugs as regards clinical efficiency.

An exact comparison between the incidence of side-effects caused by the two drugs cannot be obtained from the information available, since only rarely were comparable doses of both drugs tested in individual patients. In view, however, of the fact that the drugs and their dosages were selected with the object of minimising side-effects, the following figures are of some value. Of 18 patients started on oxytetracycline 10 were subsequently changed to tetracycline because of diarrhœa. In 6 of these the dosage was unchanged, and the diarrhœa stopped in 4 and was reduced in 2. On the other hand, 19 patients started treatment with tetracycline, but only 4 were changed to oxytetracycline (the same dosage in each case). The diarrhœa stopped in 1 and was reduced in 3. From the experience gained both in this trial and with other patients, it seems that diarrhœa, the most troublesome side-effect observed, is less often caused by tetracycline than oxytetracycline.

Although the side-effects could sometimes be eliminated, and usually reduced, by changing the drug and reducing the dosage, 14 of the 37 patients still had some discomfort from their maintenance dosages (table III). In only 2, however, was this sufficient to warrant stopping treatment. A simple kaolin mixture was often sufficient to control minor degrees of diarrhœa.

TABLE III—OVER ALL RESPONSE OF 37 PATIENTS TO CONTINUOUS TETRACYCLINE OR OXYTETRACYCLINE THERAPY, AND INCIDENCE OF SIDE-EFFECTS

No. of patients	No. showing over-all improvement	No. improved on a larger dosage but unable to tolerate it	No. showing no over-all improvement	Side-effects		
				No. on initial treatment	No. on maintenance dose	No. stopping treatment
37	22	4 (cases 3, 8, 11, and 24)	11 (cases 7, 13, 15, 17, 19, 25, 27, 33, 34, 35, and 36)	17	14	2 (cases 7 and 27)

Commonest side-effect was diarrhœa. One patient complained of giddiness, and another of flatulence.

TABLE IV—DAILY MAINTENANCE DOSAGE OF 22 PATIENTS IMPROVED BY CONTINUOUS CHEMOTHERAPY

Maintenance dosage (g.)	No. of patients
0·50 t.d.s.	3 (cases 1, 2, and 26)
0·50 b.d.	7 (cases 12, 14, 20, 21, 23, 28, and 37)
0·25 t.d.s.	4 (cases 4, 5, 6, and 10)
0·25 b.d.	6 (cases 9, 16, 22, 29, 31, and 32)
0·25 daily	2 (cases 18 and 30)
Total ..	22

TABLE V—INCIDENCE OF COAGULASE-POSITIVE STAPHYLOCOCCI IN SPUTUM AND ANTERIOR NARES OF PATIENTS RECEIVING CONTINUOUS CHEMOTHERAPY

Coagulase-positive staphylococci in cultures of					
Sputum				Anterior nares	
After 4 mos.' treatment (28 patients examined)		After 6 mos.' treatment (24 patients examined)		After 6 mos.' treatment (21 patients examined)	
Present	Absent	Present	Absent	Present	Absent
7 (25%)	21 (75%)	5 (21%)	19 (79%)	4 (19%)	17 (81%)

Appearance of Antibiotic-resistant Staphylococci

Unfortunately, only very few control cultures for staphylococci were made before treatment; so no baseline figures are available. However, the frequency of isolation of coagulase-positive staphylococci from the sputum after four months' and six months' treatment, and from the nose after six months, is shown in table v. There is no significant difference between the three series of cultures. All 4 patients from whose anterior nares staphylococci were isolated also harboured them in their sputum, and all the strains were resistant to 10 μg. per ml. or more of the tetracycline drugs. It therefore seems that about a quarter of patients receiving these drugs for six months will be carriers of resistant coagulase-positive staphylococci, although there is no information about how many of the patients actually acquire the organisms during treatment.

Discussion

There can be no doubt that many patients with chronic bronchitis derive considerable benefit from continuous chemotherapy, and the factual presentation of the over-all results given above does not do justice to the dramatic improvement brought about in some patients. Although the assessment of objective changes, such as the purulence of the sputum, may provide the most reliable measure of improvement, the patient's own feelings and his capacity to lead a normal life are, after all, the real test. The change by which patients are perhaps most impressed, when having continuous chemotherapy, is the failure of head colds to "go down to the chest as they used to do." It was commonplace in this trial to hear a patient remark that he had had a cold in the head for a few days, but his chest remained clear, whereas previously he would have been unable to work for weeks. The improvement in general health was often no less striking, as in the case of the patient who, while taking tetracycline, was "able to eat and drink and generally enjoy a normal Christmas with the family for the first time for five years." Improved sleeping and increased appetite and weight were also often commented on, but dyspnœa was seldom alleviated, possibly because most of the patients had considerable emphysema. Sometimes the increased viscosity of the sputum, when it was freed from pus, caused a worsening of the dyspnœa, and the liberal use of expectorants was then required.

Although many patients benefit from long-term chemotherapy, there are various problems associated with its use. The first is the selection of suitable patients. No antibacterial treatment is of any value in patients with mucoid sputum (May 1953b); so one must first be satisfied that pus is present. The possibility, especially in asthmatics, that apparent "pus" is composed of eosinophils must not be overlooked (May 1954). Patients who are likely to benefit from the treatment usually start to improve rapidly, and chemotherapy should be abandoned if no obvious benefit is produced within a month, provided that the dosage has been adequate. As a routine in this clinic, 0·5 g. t.d.s. is prescribed at the start, and tetracycline is the first choice of drug because it seems to cause fewer side-effects than oxytetracycline. If no change has taken place after a month of this dosage, there is no point in continuing treatment. The patient is unlikely to benefit materially, money will be spent unnecessarily, and resistant staphylococci may well be disseminated unnecessarily. But, if the sputum becomes mucoid and the patient is obviously improving, the dosage is reduced by stages to the smallest amount that will keep the sputum mucoid.

Two criticisms often levelled at long-term chemotherapy are its cost and the danger of disseminating antibiotic-resistant organisms, especially staphylococci. The average maintenance dosage of the 22 present patients who were improved was 0·82 g. daily—about 6 g. a week. The cost of the tetracycline drugs to hospitals at present is 6*s*. per gramme; hence these patients cost an average of 36*s*. a week each. 9 of the patients were in the "controlled group," and it is therefore possible to compare the number of working-days lost by these patients each winter. While they were having chemotherapy these 9 patients lost from work an average of 31·6 days fewer per patient than in the comparable six months without chemotherapy. This indicates a cost, in terms of antibiotics, of 29*s*. per patient per working-day saved. Against this must be set the value of the work done by the patient and the cost to the community if he was off work, receiving National Insurance Benefit, and possibly in hospital. Although these figures refer to only 9 patients in two winters, viewed in this light the cost of long-term chemotherapy does not seem unreasonable, and there is always, of course, the possibility of a reduction in the cost of these drugs.

The information obtained about the development of antibiotic-resistant coagulase-positive staphylococci is rather incomplete, but in round figures it appears that about a quarter of the patients are potential sources of dissemination of these organisms. This is an alarming figure, although it is in keeping with the incidence of resistant staphylococci among hospital patients generally (Barber and Burston 1955). Whether it is sufficient to justify a decision to deny to a suitable chronic bronchitic the undoubted benefit of long-term chemotherapy is a matter for the conscience to decide.

The total period for which chemotherapy can be continued with benefit is a matter for speculation. Helm et al. (1956) report continued benefit after nearly three years' treatment, and several patients attending the Bronchitis Clinic have been receiving tetracycline for two years or more with no indication that the drug is losing its efficiency. The ultimate development of resistant strains of *H. influenzæ* will probably set the limit for treatment, but this does not seem to take place at all rapidly. There is some evidence (Helm et al. 1956) that stopping the treatment and restarting after a short interval may encourage the development of resistant strains, but whether such strains, left without treatment for long periods (say six months), would revert to their original sensitive state is not known. To investigate this possibility most of the present patients are now receiving no chemotherapy during the summer and will be restarted next winter.

Summary

Continuous therapy with either tetracycline or oxytetracycline was given to 37 patients with advanced purulent bronchitis during the six winter months. Improvement, often striking, was noted in 22 (59%). Therefore this form of treatment seems to be valuable in preserving reasonable health in the later stages of purulent chronic bronchitis.

About half the patients experienced side-effects from the drugs, but these were severe enough to necessitate

stopping treatment in only 2. Diarrhœa was the commonest side-effect.

About a quarter of the patients were carriers of antibiotic-resistant coagulase-positive staphylococci at the end of the trial.

We wish to thank Lederle Laboratories for a generous supply of tetracycline, and Dr. W. E. Chiesman and Dr. V. C. Medvei, of the Treasury Medical Department, for their continued interest in our investigations into bronchitis in the Civil Service.

REFERENCES

Barber, M., Burston, J. (1955) *Lancet*, ii, 578.
Elmes, P. C., Knox, K., Fletcher, C. M. (1953) *Ibid*, ii, 903.
Helm, W. H., May, J. R., Livingstone, J. L. (1954) *Ibid*, ii, 630.
— — — (1956) *Ibid*, i, 775.
Knox, K., Elmes, P. C., Fletcher, C. M. (1955) *Ibid*, i, 120.
May, J. R. (1953a) *Ibid*, ii, 534.
— (1953b) *Ibid*, p. 899.
— (1954) *Ibid*, ii, 859.
Mulder, J., Goslings, W. R. O., van der Plas, M. C., Lopes Cardozo, P. (1952) *Acta med. scand.* **143**, 32.
Rawlins, G. A. (1953) *Lancet*, ii, 538.
Reid, L. M. (1954) *Ibid*, i, 275.
Stuart-Harris, C. H., Pownall, M., Scothorne, C. M., Franks, Z. (1953) *Quart. J. Med.* **22**, 121.

RAPID CHANGES IN SENSITIVITY TO STREPTOMYCIN AND ERYTHROMYCIN IN STAPHYLOCOCCAL SEPTICÆMIA

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IN a case of staphylococcal septicæmia at St. Olave's Hospital the sensitivity of the infecting organism in relation to the drugs used was followed throughout the disease.

Case-report

A woman aged 38, was admitted to hospital on June 5, 1956, with a week's history of dyspnœa. On admission she was extremely ill, with rapid respirations, her liver and spleen were palpable, and fulminating pneumonia was diagnosed. Blood-cultures grew a coagulase-positive penicillin-resistant *Staphylococcus aureus*. She was treated with large doses of antibiotics. Blood-cultures were made at short intervals, and changes in the sensitivity of the infecting organism were followed closely. When resistance had developed to penicillin, chloramphenicol, streptomycin, and erythromycin, novobiocin was used, which rendered the blood sterile within twenty-four hours. The patient, however, died thirteen days after admission.

Necropsy Findings

Necropsy fifteen hours after death showed a large right-sided empyema, multiple abscesses throughout both lungs, and an enlarged liver weighing 4½ lb. and showing early amyloid change. Both kidneys contained metastatic abscesses, and the left ovary and fallopian tube contained pus. The uterus was enlarged and its endometrium necrotic.

Cultures made from the abscesses of the kidneys, lungs, ovary, and fallopian tube all grew a *Staph. aureus* which was of the same phage-type (table I) and showed the same sensitivity (table II) as that from the original blood-culture.

Bacteriology and Antibiotic Therapy

On admission, after the first sample of blood had been taken, chloramphenicol 750 mg. was administered by mouth. Next morning a further 250 mg. was given. The chloramphenicol was then discontinued on clinical grounds, before it was found that the organism was resistant to it, because the patient had severe diarrhœa and there was no polymorph response to the infection.

Treatment with penicillin and streptomycin was then started. The staphylococcus was originally sensitive to the streptomycin disc, but a few colonies grew within the zone of inhibition, and after five days, when 10 g. of streptomycin had been given, full resistance had developed. On the fifth day after admission, no clinical change being noted and the patient's temperature not settling, erythromycin therapy was begun, but a blood-culture on the ninth day showed that the staphylococcus was completely resistant to erythromycin after 6000 mg. had been given by mouth and 900 mg. intravenously. At this stage novobiocin was given. A blood-culture before the start of novobiocin therapy showed that the staphylococcus was sensitive to this antibiotic. Twenty-four hours later, after 2 g. of novobiocin had been given, the blood was sterile.

TABLE I—PHAGE-TYPES

Source of staphylococcus	Phage-type	
	Diluted	Undiluted
Abscess of arm	52 A +	
Blood-culture on 1st day ..	..	52/52A/79/80
Blood-culture on 7th day ..	..	52/52A/79/80
Blood-culture on 9th day ..	52 A.V.W.	52/52A/79/80
Kidney abscess post mortem	52A +	
Ovary post mortem	52A/79 +	
Left lung post mortem ..	52A/79 +	
Empyema	52A/79 +	

These strains are most probably the same.

After death all the cultures obtained from this patient, both ante and post mortem, were submitted for phage-typing and were reported as being "most probably of the same strain" (table I). The sensitivity of the staphylococcus isolated from the several blood-cultures and an abscess during life were determined by the plate method, using compressed antibiotic tablets (Evans Medical Supplies Ltd.), and the results were compared with the antibiotic therapy (table II).

Discussion

The development of resistance in *Staph. aureus* to streptomycin in five days, and then to erythromycin in four days, was followed in this case by repeated blood-cultures.

TABLE II—SENSITIVITY

Day	Chloramphenicol (mg.)	Penicillin (mega units)	Streptomycin (g.)	Erythromycin (mg.)	Novobiocin (g.)	Source of staphylococcus	Sensitivity
1	750	..	..	..	..	Blood-culture	Resistant to penicillin and sensitive to streptomycin and erythromycin
2	250	4	2	..	..		
3	..	4	2	..	..		
4	..	4	2	..	..		
5	..	1	2	1500	..		
6	..	8	2	900	..	Abscess	Resistant to penicillin, resistance developing to streptomycin, sensitive to erythromycin
7	..	8	2	1500	..	Blood-culture	Resistant to penicillin, sensitive to erythromycin
8	..	6	2	1500	..		
9	..	..	1	1500	..	Blood-culture	Resistant to penicillin, streptomycin, and erythromycin
10	..	..	..	..	2·0		
11	..	..	..	..	2·0	Blood-culture sterile	
12	..	..	..	..	1·5		
13	..	..	..	..	1·0		

The staphylococcus isolated post mortem from the abscesses was, like that of the first blood-culture, resistant to penicillin only. Does this mean that the antibiotics were not reaching those abscesses.

Novobiocin has been recommended by Lubash et al. (1956) for use in infections by staphylococci resistant to other antibiotics, but Garrod and Waterworth (1956) have shown that staphylococci rapidly develop resistance to novobiocin in vitro.

Anderson (1954) reported a staphylococcus resistant to five antibiotics, but our organism, unlike his, was at all times fully coagulase-positive and continued to produce pigment.

Our thanks are due to Dr. Mary Barber, of St. Thomas's Hospital, for the supply of novobiocin and also for confirming the sensitivity of the staphylococcus, and to Dr. R. E. O. Williams, of the Public Health Laboratory, Colindale, for the phage-typing.

REFERENCES

Anderson, K. (1954) *J. clin. Path.* **7**, 148.
Garrod, L. P., Waterworth, P. M. (1956) *Brit. med. J.* ii, 61.
Lubash, G., Van Der Meulin, J., Berntsen, C., Tompsett, R. (1956) *Antibiotic Med.* **2**, 233.

A STICK IN THE EXTERNAL ILIAC VEIN

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THIS case is reported because of the unusual nature of the wound and to emphasise the importance of leaving penetrating weapons in the body at first. They can be removed later under favourable conditions for dealing with any emergencies that may arise.

Case-report

A boy, aged 10 years, was admitted to hospital with a piece of dirty wood 1 inch square protruding about 1 inch from his right thigh, 2 inches below the middle of Poupart's ligament, and running proximally and medially. The boy said later that lots of blood ran out when he was wounded, but his blood-pressure was 110/70 mm. Hg on admission. He had been pushed by another boy and had fallen on to a jutting out piece of wood which pierced his groin and broke off. Apart from the wound and foreign body the right lower limb looked normal on admission but during a few minutes' stay in the casualty department it became progressively more cyanosed and swollen.

On examination half an hour after admission the boy was pale and shocked with guarding and tenderness in his right iliac fossa. His right leg was visibly swollen and cyanosed, the foot was pale, and the toes were almost white. The right popliteal, posterior tibial, and dorsalis pedis arterial pulsation was absent, and there was anæsthesia below the right ankle. Treatment with antitetanic serum, penicillin, and a blood-transfusion was started.

Operation.—It was thought that the right femoral artery had been severed, and after a short period for resuscitation an operation was done under general anæsthesia (Dr. W. P. Lee). A longitudinal incision was made in the line of the femoral vessels, starting 2 inches distal to the wound, crossing the middle of Poupart's ligament, and running up to a point an inch medial to the anterior superior iliac spine. The external oblique aponeurosis was divided, in the direction of its fibres, down to the external abdominal ring, and the spermatic cord was identified and protected during the remainder of the operation. The internal oblique muscle was divided across its fibres, and the transversalis fascia divided in the same line. It was then possible to strip the peritoneum back towards the midline. A small opening was made in the peritoneum and the absence of blood in the peritoneal cavity demonstrated. This opening was then closed. As the peritoneum was stripped medially, it was discovered that the stick, which was $4^1/_2$ inch long and tapered at the tip to a diameter of less than $^1/_2$ inch, had entered the femoral vein at the level of Poupart's ligament and that its end was lying within the external iliac vein at the middle of the pelvic brim. The vein was about $^3/_4$ inch in diameter, and soft clot was felt surrounding the foreign body in its lumen. The external iliac vein was ligated proximal to the end of the stick, and the femoral and great saphenous veins were ligated distal to its protruding end. The wood was then safely withdrawn and the damaged portion of vein removed. Attention was next directed to the arteries. The external iliac artery was pulsating weakly, but the femoral artery was in spasm and pulseless. The foreign body had been pressing on it firmly. The artery was dissected free from its surroundings and 2% procaine injected into the adventitia. Pulsation in the femoral artery restarted shortly afterwards. The wound was closed in layers, with drainage at the site of the stab wound, and pulsation was felt in the right dorsalis pedis artery on the boy's return to the ward. The colour of the limb remained normal thereafter, but the limb has continued to be somewhat swollen.

Postoperatively the stitches were removed on the tenth day, when the wound was soundly healed and the boy was allowed to get up. Three weeks after the incident he had no symptoms, but his right leg and right testicle were somewhat swollen. There was induration deep to the scar in the groin and right thigh.

This case illustrates the value of thorough exposure before the removal of objects which have inflicted, and remain in, stab wounds. This is all the more important when the wound is in the vicinity of vital structures and when there are signs of damage to large vessels.

HERPES OPHTHALMICUS

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HERPES ZOSTER and concurrent generalised rash has been previously reported (Roxburgh and Martin 1926, Hewitt 1954); but there is considerable doubt whether herpes zoster can be disseminated or whether such cases are a combination of herpes zoster and varicella. The following case is therefore important.

Case-record

A retired business man, aged 76, with chronic myocardial disease and no previous history of varicella, on Nov. 2, 1954, began to have shooting pains over the left side of the scalp; and on Nov. 7 herpetiform vesicles with surrounding areas of erythema were present on the left forehead, scalp, and left side of nose.

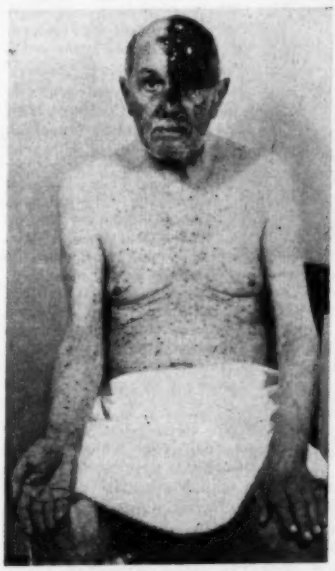

Fig. 1—Hæmorrhagic necrosis of scalp and rash elsewhere.

Nov. 9: Severe conjunctivitis of left eye.

Nov. 12: Profuse eruption of small vesicles with a ring of erythema on the trunk and limbs. Extensive hæmorrhagic necrosis of scalp area (left) with severe toxæmia.

Nov. 16: Keratitis of left eye, corneal ulceration, and hypopyon.

Dec. 14: Rash on trunk and limbs healed, leaving depressed brown pigmented scars.

Dec. 21: Separation of scalp eschar, leaving a patchy raw granulating area.

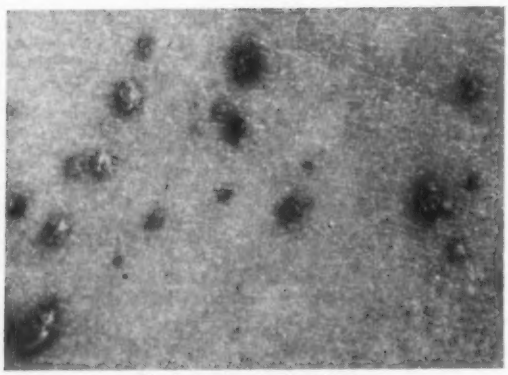

Fig. 2—Rash on back of thorax.

Jan. 11, 1955 : The left eye appreciates only light and dark.
Jan. 28 : The scalp area heals to a certain point and then breaks down into shallow ulcers.
Feb. 13 : Perforation of left corneal ulcer, soon followed by panophthalmitis.
March 1 : Considerable herpetic neuralgia.
April 2 : Large areas of the scalp are still raw, though the underlying tissue seems to have a good blood-supply.

In view of the reported coincidence of generalised herpes zoster and leukæmia, blood-counts were done on Dec. 8, 1954, and Feb. 3 and Dec. 30, 1955, with normal findings. In the right eye there were senile degenerative changes around the macula.

Description of Rash

The rash was widely scattered over the trunk and limbs with a maximal concentration on the back of the trunk ; the hands and feet were unaffected. There were no successive crops of spots. The spots were small vesicles, of different sizes, each surrounded by a small ring of erythema. Some were hæmorrhagic ; others contained clear fluid. There was no irritation.

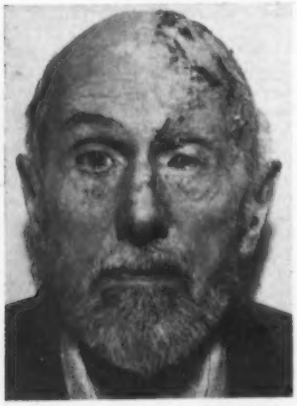

Fig. 3—Twelve months later, showing scarring with distortion of eyelids, and residual scabs in affected area

Treatment

Local and systemic administration of penicillin, aureomycin, neomycin, and cortisone had no effect.

Present Condition

The scarred scalp is now (April, 1956) well demarcated by some contraction of the scar tissue. The scars are brown and deeply depressed. The left eyelids are deformed. The scalp skin is thin and atrophic and readily breaks down into shallow ulcers. Stabbing pains are experienced over the scalp with a constant sensation of " stinging ants " beneath the skin of the left orbit. There is residual brown pigmentation on the trunk and limbs, corresponding to the distribution of the rash. The left eye is completely blind.

Discussion

In this case the generalised rash was either herpes zoster or varicella. The subsequent deeply depressed brown scars were unlike the usual slightly depressed white scars of varicella. Varicella developed in neither of two susceptible contacts who nursed the patient.

The generalised rash was probably caused by viræmia. Brain (1933) suggested that the virus of herpes zoster may have both neurotropic and dermatotropic properties. Hewitt (1954) described " herpes zoster generalisatus " or " herpes zoster varicellosus " in four chronically ill patients ; and this generalised form may develop in patients with leukæmia. Age and lowered resistance to infection may be factors in such a spread. Aberrant herpetic vesicles may be scattered widely over the body, and these may be so numerous as to be indistinguishable from varicella ; profound toxæmia is common.

Hæmorrhagic necrosis occurs particularly with herpetic lesions of the ophthalmic division of the trigeminal nerve. Involvement of the nasociliary branch of this nerve leads, as in the present case, to ocular complications.

Summary

A case of severe herpes ophthalmicus with concurrent generalised herpetiform rash is described.

After seventeen months the scalp skin is thin and atrophic and still breaks down into shallow ulcers. The left eye is blind.

It gives me great pleasure to thank Dr. J. R. Simpson, of Exeter, and Mr. G. Flint, of Lympstone, for their help and advice. Mr. H Fish, of Sidmouth, produced the excellent photographs.

REFERENCES

Brain, R. T. (1933) *Brit. J. exp. Path.* **14**, 67.
Hewitt, M. (1954) *Med. J. South West.* **70**, 1.
Roxburgh, A. C., Martin, P. H. (1926) *Brit. J. Derm.* **38**, 286.

Preliminary Communication

AUTO-ANTIBODIES IN HASHIMOTO'S DISEASE (LYMPHADENOID GOITRE)

PATIENTS with Hashimoto's disease (lymphadenoid goitre) have high serum-γ-globulin levels [1–3] which give rise to abnormalities in the flocculation tests of liver function—e.g., zinc-sulphate and thymol turbidities and colloidal-gold flocculation. The highest values are found in untreated patients with large goitres. In a post-operative survey of patients who had a thyroidectomy for histologically proved Hashimoto goitre 6 months to 23 years previously, the γ-globulin levels and flocculation tests were normal in the great majority of cases. In two patients tested before and at intervals after thyroidectomy, the γ-globulin levels slowly returned to normal during the 6 months after operation.[4]

The raised γ-globulin levels, their delayed return to normal after thyroidectomy, and the infiltration of the thyroid with lymphoid tissue, lymphocytes, and numerous plasma cells suggested that an immune response might be involved in this disease. To test this hypothesis, precipitin reactions between the sera of patients with Hashimoto goitres and saline extracts of normal and

1. Fromm, G. A., Lascano, E. F., Bur, G. E., Escalante, D. *Rev. Asoc. méd. argent.* 1953, **67**, 162.
2. Skillern, P. G., Crile, G., McCullagh, E. P., Hazard, J. B., Lewis, L. A., Brown, H. *J. clin. Endocrin.* 1956, **16**, 35.
3. Luxton, R. W., Cooke, R. T. *Lancet*, July 21, 1956, p. 105.
4. Doniach, D., Vaughan Hudson, R. (to be published).

PRECIPITIN REACTIONS OF SERA WITH THYROID EXTRACTS*

Serum	No. of cases	Precipitation
Hashimoto† :		
Untreated	2	++ ++
Thyroxine-treated	4	++ ++ + +
4 months postoperative	1	+
Small goitre, treated	2	– –
Normal	2	– –
Myxœdema	2	– –
Thyrotoxicosis	5	All neg.
Non-toxic nodular goitre	6	All neg.
Multiple myeloma	1	–

* No difference was observed between extracts of thyrotoxic and normal thyroid.
† Clinical details of the Hashimoto cases are given elsewhere,[4] except for two new untreated patients. These are both classical cases with large symmetrical firm goitres, myxœdema, high γ-globulin levels, and raised flocculation values.

thyrotoxic human thyroid glands were carried out. The results are shown in the accompanying table. Patients with Hashimoto goitre gave precipitins, but normal subjects and patients with other thyroid diseases showed negative results.

To establish whether the antibodies were organ-specific to thyroid gland, saline extracts of the thyroid and other organs from the same individual were tested against the serum of a Hashimoto patient. No precipitins were obtained against brain, liver, kidney, spleen, lymph-node, or parotid gland. Cross-reactions between a Hashimoto serum and saline extracts of rabbit and rat thyroid glands could not be demonstrated by precipitin reactions. In an attempt to identify the antigen(s) in the thyroid extract, human thyroglobulin was purified.[5] Comparable precipitins were obtained, suggesting that thyroglobulin is implicated.

Recent experiments by Rose and Witebsky [6] on the immunisation of rabbits with extracts of their own thyroid appear to support our findings. Precipitins were obtained in the serum of these animals, and were shown to be organ-specific against rabbit thyroid. Histological examination of the remaining lobe of the thyroid gland in the immunised animals showed pronounced disorganisation of the gland with disappearance of thyroid follicles, evidence of thyrotrophic-hormone overactivity in remaining thyroid cells, and widespread lymphoid infiltration. The degree of histological damage appeared proportional to the antibody titre of the individual rabbits.

It may be concluded that patients with lymphadenoid goitre are immunised against human thyroglobulin, and we suggest that destruction of the thyroid in Hashimoto's disease results from progressive interaction of thyroglobulin in the gland with the auto-antibody present in the patient's circulation.

The precipitin reaction of serum with extract of human thyroid gland may prove a more specific diagnostic test for Hashimoto's disease than estimation of serum-γ-globulin or liver-function tests.

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5. Derrien, Y., Michel, R., Roche, J. *Biochim. biophys. Acta*, 1948, **2**, 454.
6. Rose, N. R., Witebsky, E. *J. Immunol.* 1956, **76**, 417.

Medical Societies

ROYAL SOCIETY OF MEDICINE

Hypothermia

AT a meeting of the section of experimental medicine on Oct. 9, with Prof. C. A. KEELE, the president, in the chair, Hypothermia was discussed.

Sequelæ of Circulatory Arrest

Dr. E. NEIL, after describing a series of experiments indicating that reduction in temperature does not of itself affect the acid-base equilibrium of the blood, showed that during hypothermia acidæmia occurs which is not explicable on the basis of a respiratory effect. This acidæmia is mild unless circulatory arrest is superimposed upon cooling, when it may become more severe.

Dr. Neil showed that the liver is not seriously damaged during hypothermia, and any cellular change is evanescent. But circulatory arrest and the resulting venous congestion produces alarming histological appearances in the hypothermic liver. These changes depend on the time that the circulation is obstructed, and he suggested that as short a period as was possible should be insisted upon. To support the histological findings a series of experiments on the clearance of galactose was carried out, and the result of this liver-function test supported the histological evidence for the view that venous congestion rather than cold alone accounted for the damage to the liver. Additional evidence was provided by an experiment designed to relieve this congestion by removing venous blood from the inferior vena cava. When as much as a third of the blood volume was removed in this way during the period of circulatory arrest the effects on the liver resembled the picture in hypothermia alone. Dr. Neil drew attention to the very large amount of venous blood that had to be withdrawn, and suggested that the technique is unlikely to be practicable in man.

Dr. SHEILA SHERLOCK criticised the use in this context of the word "congestion" and suggested that "impairment of venous outflow" might be more appropriate. She asked whether ascites accompanied the liver damage and whether centrizonal necrosis had been demonstrated in patients who had failed to survive circulatory arrest during hypothermia. Dr. NEIL reiterated his view that both congestion and anoxia were responsible for these changes and that ascites did in fact accompany the liver damage, but he could not report liver changes in a small series of cases in which the patients had not survived operation. He drew attention to other centres of damage; similar changes had been found in the kidneys, the adrenals, and the gut.

Practical Problems

Dr. B. G. B. LUCAS discussed the two most usual methods of inducing hypothermia—namely, reducing temperature by surface-cooling, and cooling the blood-stream itself. He made clear that there was no fundamental difference between these two methods, but suggested that, while surface-cooling was wholly satisfactory for children below the age of three or four, blood-stream cooling could be more easily carried out in patients not easily moved from bath to operating-table and back. He described briefly his method for blood-stream cooling whereby a coil of plastic tubing is immersed in saline solution containing alcohol 10% and solid carbon dioxide. This mixture provided a constant temperature of −2°C. The œsophagus gave a most accurate indication of the central body temperature, but the skin of the forehead could be a fair guide once the temperature had fallen below 30°C.

As regards the safe duration of circulatory arrest at various levels of hypothermia, there was still no clear-cut evidence, but arrest should not be longer than five minutes at 28°C. Longer than that time required lower temperatures. He denied that ventricular fibrillation was a barrier to lower temperatures, and was of the opinion that no drugs were of any prophylactic value against this complication.

Hypothermia in Clinical Surgery

Mr. D. N. ROSS based his remarks on experience of 70 patients all of whom had withstood circulatory arrest for five to ten minutes. He suggested that the most important hazard was anoxic brain damage, particularly that associated with ventricular fibrillation. There was no real difficulty in electrical defibrillation provided that this technique was used in the proper circumstances. Defibrillation should not be attempted unless the myocardium had been oxygenated by cardiac massage. He agreed with Dr. Lucas that drugs were of little avail and stressed the need to avoid trauma. Returning to the problem of duration of circulatory arrest, Mr. Ross agreed that a safe maximum was ten minutes at 28°C.

This period made surgery of interatrial defects, pulmonary-valve defects, and aortic-wave defects possible, but would not permit operation on the ventricular septum or for the tetrad of Fallot. He concluded by drawing attention to the rate at which cooling was carried out and warned against attempts at making this too rapid. He felt that a drop of 1°C in four minutes was appropriate for children, while the same drop should take six minutes in adults. At this cooling-rate there was an even reduction in temperature.

Dr. H. H. KHALIL (Egypt) drew attention to the very large vascular anastomosis within the walls of the stomach, and the presence around the stomach of many important and large blood-vessels, and pointed out that as much as a half of the cardiac output passed through this area. He described a method of body-cooling which did not depend either on surface-cooling or on cooling the blood-stream itself. He had devised a technique whereby water cooled to about 4°C is circulated through a large intragastric balloon. Provided over-distension of the balloon was avoided no deleterious effect on the stomach itself could be demonstrated either histologically or in terms of gastric function. This method provided an efficient and relatively simple means of inducing hypothermia. Cooling was gradual, and at a rate closely approximating to those achieved by more conventional methods. Dr. Khalil was impressed by the absence of untoward arrhythmias or other complications, and felt that this was in part due to the even drop in temperature. Rewarming could be carried out by substituting warm water for cold in the balloon.

Discussion

Dr. B. A. SELLICK described his experience with surface-cooling. He proposed that the patient should be transferred from a cold bath to a warm blanket on the operating-table, so that rewarming took place while the operation was being carried out. He suggested that the "afterdrop" in temperature could be minimised in this way. He supported the view that the period of circulatory arrest should be kept to the absolute minimum.

Dr. G. R. GRAHAM noted that electrocardiographic changes were commoner with blood-stream cooling than with cooling by surface methods. He had demonstrated that electrocardiographic changes took place within four minutes of respiratory arrest at 28°C, and suggested that this time should be regarded as a mean about which operating-times should be established. He denied that the current of injury potential described by J. J. Osborn was in fact a current of injury potential, though he could not give an alternative explanation.

HARVEIAN SOCIETY OF LONDON

Antibiotic Therapy

AT a meeting on Oct. 3, with Dr. M. C. W. LONG, the president, in the chair, Dr. MAXWELL FINLAND (Harvard) discussed Current Problems in Antibiotic Therapy. Within the scope of this title, Dr. Finland included the sulphonamides, which, he said, are particularly valuable in the treatment of meningococcal infections, dysentery, and streptococcal infections, and in the prevention of recurrent attacks of acute rheumatism. Over the years meningococci have retained their initial sensitivity to sulphonamides, in contrast to that other member of the neisseria family, the gonococcus, which has shown evidence of sulphonamide resistance. As regards the control of dysentery, Dr. Finland raised the controversial problem of whether to attack the organism in the wall or in the bowel of the gut, and expressed his personal preference for the absorbable to the non-absorbable sulphonamides. Prophylactic administration of sulphonamides—notably sulphadiazine—has been effective against β-hæmolytic streptococcal infections and has led to an 80% reduction in the incidence of rheumatic fever in the United States Armed Services. Dr. Finland also drew attention to the value of penicillin in the prevention and treatment of this condition. He remarked that the sensitivity of *Streptococcus viridans* to penicillin remained unchanged between 1944 and 1953. He suggested that in the treatment of staphylococcal infections the greatest promise lay in the use of a combination of any two antibiotics to which the organism was initially sensitive. Subsequently Dr. Finland suggested that the potential value of oral neomycin was largely due to the fact that it was not used as widely as other antibiotics; its restrained use, he inferred, had averted the emergence of antibiotic-resistant strains.

Prof. L. P. GARROD, returning to the problem of whether antibiotics kill bacteria in the tissue or in the lumen of an organ, pointed out that novobiocin is successful in the treatment of certain urinary-tract infections although only 3% of it is excreted in the urine. He also questioned the value of antibiotics in clean surgery, such as gastrectomy operations.

New Inventions

A COMPACT AND EASILY CONTROLLED NEW WALKING-AID

WALKING-AIDS have an established place both in short-term rehabilitation and in keeping ambulant patients with a permanent locomotor defect. Their usefulness in and about the home in the latter case is often greatly limited by their clumsiness, and even in hospital their bulk may cause difficulties. The machine illustrated here is sufficiently light and compact to be easily stored and transported, and, in addition, is very manageable. This last is largely the result of the ingenious application of a simple system of braking, which allows the use of large-diameter ball-bearing wheels while avoiding the risk of the machine's running away on a sloping surface or under the influence of the user's weight. It was originally designed for his own use by an elderly gentleman with advanced osteo-arthritis of both hips and was made for him by Messrs. Fordham Pressings Ltd., Melbourne Works, Dudley Road, Wolverhampton. This firm has since effected various improvements in lightness and stability and are now producing the walking-aid under a provisional patent.

The frame consists of two triangulated members in steel tube, hinged at the front above a single castor about 7 inches in diameter, and opening, when the machine is in use, to form an angle of 70–80°. This angle is maintained by a short length of chain attached just below the handles. The rear of each member is supported by a smaller wheel. Braking is provided by a friction pad, which can be brought to bear on the upper-

most part of the front wheel and is actuated by a twist-grip control forming the handle on the right. The total weight is less than 14 lb.

I have had a few months' experience of the apparatus, with a fairly wide variety of patients ranging from a 12-year-old child with cerebral palsy to an old lady of 84 with severe post-rheumatoid changes in her hands and in both hip-joints. Postoperative use has mainly been after weight-relieving osteotomies and Smith-Petersen nailings, and these patients have, of course, been in hospital. Most of the others have been observed in their homes by lending the apparatus for one or two weeks. In these circumstances patients have all seen the walking-aid depart again with regret, having accustomed themselves to its use in a very short time. I have been impressed by the rapidity with which confidence in walking is regained. Even the very elderly (who have ordinarily avoided any previous contact with a twist-grip mechanism) find the braking action natural and can soon negotiate steep slopes, while still being able to lean on the handles as heavily as their disability demands.

Only rarely has any difficulty arisen, and this always in the immediate postoperative period in patients who were aged and infirm. These, in their first few days' activity, require more support than can comfortably be provided by the use of the hands alone. The same may be true of general arthritis; but even here the use of an adequately braked wheeled apparatus represents a considerable advance on anything that has hitherto been available, and the principle obviously merits extended application. Consideration is therefore now being given to the production of an additional model with crutch-type supports but retaining the same means of control. In its present form, however, the machine already has a wide range of usefulness both in hospital and in the home.

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IMPROVED PORTABLE OXYGEN APPARATUS WITH DETACHABLE CYLINDERS FOR DOMICILIARY USE

NEARLY forty years ago Haldane[1] suggested that portable oxygen would be the next development in oxygen therapy; it has long been delayed by lack of suitable equipment. Recently the position has improved, and light-weight sets holding useful quantities of oxygen have become available (e.g., Jarman[2]); further major improvements will depend on the acceptance of new materials for constructing cylinders and on the development of satisfactory alternatives to cylinder oxygen.

The present set is the third in a series designed originally for British Overseas Airways Corporation and subsequently adapted for clinical use. The novel feature of the design is that the pressure-reducing valve and flow-controller are divided between the oxygen cylinder and a detachable control head, so that difficulties associated with a high-pressure joint are avoided and the two parts can be readily screwed together with the fingers; the gas at the point of junction is at the reduced pressure (20–50 lb. per sq. in.). The pressure drops from 1800 to 20–50 lb. per sq. in. across the valve in the neck of the oxygen cylinder; this valve also acts as a stopcock. No separate on-off cock is necessary. Oxygen flows as soon as the valve is depressed by a plunger attached to a diaphragm in the control head. This is set by rotation of the top of the control head with the fingers from "off," when there is no contact, to one of two positions. In the "low" flow position the reduced pressure is about 20 lb. per sq. in. giving a flow through the outlet orifice of about 2 litres a minute; in the "high" position the pressure and flow are about 50 lb per sq. in. and 4 litres a minute respectively.

The equipment can be preset to any pair of flows; the present combination has been adopted for use in their homes by patients with chronic lung disease. For these patients 2 litres a minute is usually sufficient to raise the oxygen saturation sufficiently while at rest; 4 litres a minute delivered to a mask with a valve to prevent rebreathing is recommended for ambulant therapy.[3]

The domiciliary set (see figure) consists of an oxygen mask which does not permit rebreathing, a control head, an appropriate number of cylinders fitted with the high-pressure valve and pressure gauge, and an adapter so that the control head can also be used to give a good economy of oxygen with a standard 48 c. ft. or 120 c. ft. cylinder. The portable set is 18 in. long and weighs 4 lb. (only a little heavier than a bottle of orange squash) with its carrying case and a cylinder 3 in. in diameter holding 170 litres of oxygen at 1800 lb. per sq. in. (see table). Cylinders of this size are large enough to provide daily oxygen for climbing the stairs, going to toilet, bathing, and other essential tasks, and small enough to be easily portable either on a shoulder-strap or in a housewife's shopping-basket or by the half-dozen in light-weight cartons. Larger and smaller cylinders are also available.

Arrangements are being made for the cylinders to be recharged through dispensaries either centrally or at British Oxygen Company depots. It can also be done by decanting from a larger cylinder in the home by using a simple adapter. Two patients have, in this way, successfully used prototype sets for several months.

WEIGHTS OF INDIVIDUAL ITEMS OF EQUIPMENT

Item	Weight
Oxygen mask and tube	3–6 oz.
Control head	8 oz.
Cylinder (charged with oxygen at 1800 lb. per sq. in.) and pressure gauge:	
120 litres (2 1/4 in. diam.)	2 lb. 10 oz.
170 litres (3 in. diam.)	3 lb. 4 oz.
Carrying-case	6 oz.
Adapter for 48 c. ft. cylinder	15 oz.

The complete apparatus has been developed by, and is available from, Messrs. Walter Kidde, Northolt, Middlesex. Alternative masks are made by Messrs. Siebe Gorman, Tolworth, Surbiton, Surrey.

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1. Haldane, J. S. *Brit. med. J.* 1917, i, 181.
2. Jarman, R. *Ibid*, 1955, ii, 138.
3. Cotes, J. E., Gilson, J. C. *Lancet*, 1956, i, 872.

Reviews of Books

Medical History of the Second World War

The Army Medical Services. Campaigns Vol. I. Editor: F. A. E. CREW, F.R.S. H.M. Stationery Office. 1956. Pp. 637. 75*s*.

THIS is the first of four volumes which will describe the planning and performance of the medical services involved in the major campaigns of 1939–45. Each section contains a short account of the political and strategic background, a full description of the manœuvres of the opposed forces, and a detailed reconstruction of the work of the medical units in their primary duties of succouring the wounded and sick and removing them to safety. Preventive medicine, dental surgery, and the medical supply services are given due attention. Errors and omissions are not concealed and the lessons learned by failure are underlined. Seen as a whole the picture is a vivid one of intelligent design and dutiful performance. Not the least valuable part of the book are the critical footnotes by Sir Treffry Thompson.

Who will want to read of what happened so far afield in those six hard years? Some would prefer to forget them. Others are still stirred by recollections of comradeship and endeavour to a common end without thoughts of individual reward. Others again have been left with an abiding and serious interest in the intricate art of war. Even the merely curious will find the answers to some of their questions in these volumes. Why were we sent there? What happened to the others when they left? What was going on in that wadi on that dreadful afternoon? And if we have to fight again, this book has many lessons to teach which are already half forgotten: in atomic war they would be as useful at home as on a foreign battlefield.

The Accident Syndrome

The Genesis of Accidental Injury. MORRIS S. SCHULZINGER, M.A., M.D. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956. Pp. 234. 50*s*.

Dr. Schulzinger has based his book on his records of 35,000 accidents in his industrial and general medical practice, since 1930, in a large American mid-western community. The accidents occurred in the home, at work, in public places, at school, and on the roads, and the patients were of all social classes and occupational groups, ages, and cultural levels.

The author conceives of an accident syndrome as composed of predisposing factors, environmental hazard, trigger mechanisms, and behaviour pattern when the individual is confronted with sudden decision or danger. He dissents from the common view that about 15% of the population is responsible for 85% of all accidents. He finds that over a long enough period of observation most of the accidents occur in people with a low degree of accident-proneness—in fact, the accident-prone group is a shifting one with new individuals constantly falling in or out. The unequal distribution of accidents is due to unequal liability on the basis of age or sex, to physical or psychological stress, and to chance, as well as to accident-proneness.

Dr. Schulzinger considers that accident prevention can hardly be improved further by additional safety precautions in home or factory, but that increased knowledge of the personal factors through education of doctors and the public could substantially reduce the toll of life and limb. The book is well documented, with a useful bibliography, and it should be a source of reliable information to everyone concerned with accident prevention.

Bones for the Archæologist

I. W. CORNWALL, B.A., PH.D., lecturer, department of environmental archæology, London University. London: Phœnix House. 1956. Pp. 257. 50*s*.

PERHAPS for the first time the subject of excavated bones is considered in a volume devoted solely to it.

After a brief survey of the whole animal kingdom the different parts of the mammalian skeleton are amply described. Next follows the section which is most likely to appeal to a doctor asked by the police to identify bones that have been dug up—an ingenious key to the identification of them. The possibility of identifying mere fragments is also discussed, and the questions of fossilisation and cremation are gone into. The treatment of excavated bones in the field and their packing, transport, cleaning, strengthening, mending, and reconstruction are described, and we are told how to estimate age, sex, and stature of both man and animals from bones. The illustrations are profuse and excellent.

The Facts of Mental Health and Illness (Christchurch, N.Z.: Peryer. 1956. Pp. 215. 18*s*. 6*d*.).—In this book Dr. K. R. Stallworthy sets out information for the layman in a clear and workmanlike way. Throughout, the author shows a human touch and makes his facts understandable and practically applicable by use of homely metaphor and illustrative comment. The chapters on sex and marriage, important times and things in life (the needs of the child, the adolescent, education, choosing a job), and ourselves and others are especially well done. This book deserves to be widely read.

Cardiology (2nd ed. London: Butterworth. 1956. Pp. 574. 92*s*. 6*d*.).—The second edition of Dr. William Evans's well-known work will be welcomed by students and practitioners desiring a concise review of clinical cardiology. The book is beautifully illustrated; and especially valuable are the diagrams accompanying the radiological illustrations. Little reference is made to modern investigative methods other than phonocardiography, which is used to explain auscultatory findings in heart-disease. In a work intended primarily for the general undergraduate and postgraduate student, rather than for the intending cardiological specialist, it is perhaps unfortunate that the recent advances in the treatment of hypertension should receive but scant attention; and the author displays a very conservative attitude to cardiac surgery. Dr. Evans is to be congratulated on the brevity and lucidity of his writing, which makes the book delightfully easy to read and assimilate.

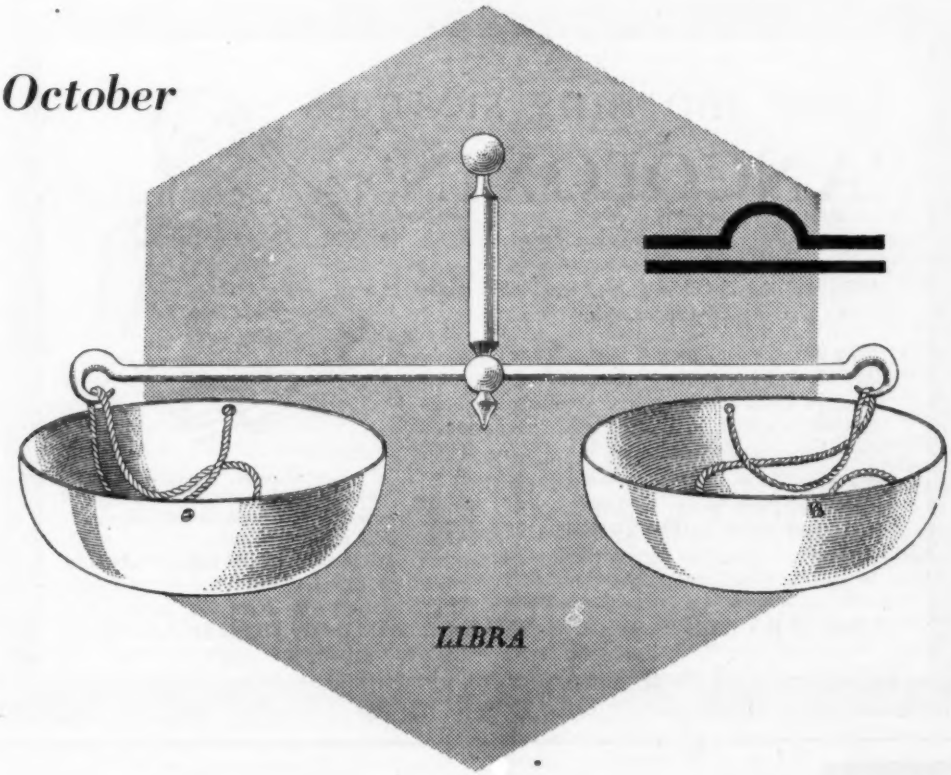
Disease in Infancy and Childhood (2nd ed. Edinburgh: E. & S. Livingstone. 1956. Pp. 710. 50*s*.).—Prof. R. H. B. Ellis's "introduction to clinical pædiatrics" was first published in 1951 and had a notable success. At a glance the second edition looks much like the first; but comparison shows that there has been thorough revision both of the text and of the illustrations; of the new illustrations 25 are in colour. The references at the ends of the chapters show similar signs of growth and pruning; the whole book is very little bigger than it was. Its success is assured.

Textbook of Gynæcology (10th ed. London: A. & C. Black. Pp. 523. 45*s*.).—Only two years have passed since the 9th edition of Professor James Young's well-known book was published. For this new edition the task of revision has been undertaken in collaboration with Prof. J. C. McClure Browne. There are two new chapters—one on bilharziasis, and the other on syphilis, granuloma inguinale, and lymphopathia venereum.

Malpighi's De Polypo Cordis Dissertatio (Stockholm: Almquist & Wiksell. 1956. Pp. 24. Sw. Kr. 12).—This beautifully produced slim folio volume contains a facsimile reproduction of a 1686 edition of Malpighi's Latin text, and a translation into English by Dr. J. M. Forrester. The polyps were thrombi inside the heart and aorta. Malpighi's power of accurate observation and his masterly command of scientific language are clearly shown. He describes the laminated appearance "like bezoar or similar stones" in which "growth takes place with time in numerous layers." Not unnaturally he gets confused between post-mortem and ante-mortem clot, for microscopes were in their infancy and would have been of little or no help to him in this problem. He noted the presence of "polyps" in the arteries of the lungs nearly two hundred years before Virchow created the conception of pulmonary embolism. It seems a pity that a bibliographic note was not included in a work thought worthy of facsimile reproduction. The dissertation was first published in 1666 in Bologna.

Progress in Radiobiology (Edinburgh: Oliver & Boyd. 1956. Pp. 557. 63*s*.).—The proceedings of the fourth International Conference on Radiobiology, which was held in Cambridge last year, have now been published under the editorship of Prof. J. S. Mitchell, F.R.S., Dr. Barbara E. Holmes, and Dr. Cyril L. Smith. Only papers reporting new work have been included. An account of the discussion on each is also given.

October



at this time of the year...

The increase in upper respiratory tract infection
calls for the discriminating use of
a safe and efficient nasal decongestant

IN A WORD... **Fenox** *NASAL DROPS*

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of Phenylephrine and Naphazoline.
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THE LANCET

LONDON: SATURDAY, OCT. 20, 1956

Poliomyelitis Vaccines

IN an ideal world the development of a new vaccine would proceed cautiously, with comparisons of different techniques of manufacture, until everyone could be sure which method produced the safest vaccine and the one with the greatest protective power for the longest period. In the world we know, scientists, administrators, and manufacturers are continually reminded that man prefers half a loaf to no bread, with the result that there is impatience to use a vaccine widely before its full effects are sufficiently known. The formolised poliomyelitis vaccine developed by SALK and his colleagues gave great promise of a good protective effect in the large-scale trial in 1954.[1] Then, after the unfortunate incidents where paralytic cases were associated with the use of certain batches of vaccine,[2] the methods of manufacture and safety-testing were modified.[3 4] In addition, it was recommended [5] that the dosage schedule should be changed to two inoculations of vaccine followed by a secondary stimulus six to twelve months later. In this form the Salk vaccine, or a modification of it, is now being widely used. There have been no further mishaps, and doubts about the safety of the vaccine have largely disappeared. Nevertheless, the protective effect is not absolute, nor is it known how long the protection lasts. In addition, a lot remains to be learned about how the inclusion of different strains of virus affects the potency of the vaccine, and how great is its protective power in young children. At the moment it seems that there may not have been enough cases of poliomyelitis this year to test adequately the vaccine prepared in this country.

Meanwhile, research on alternative techniques of preparing poliomyelitis vaccines is being pursued constantly. Among the vaccines which are being developed are the ultraviolet-inactivated vaccine described by WOLF et al.[6] and the living attenuated virus vaccines of KOPROWSKI and his co-workers and SABIN. It is now four years since KOPROWSKI et al.[7] reported the first experiments in which live avirulent poliomyelitis viruses were given to children by mouth. Since then these workers have described trials in man with virus grown in chick embryos or mouse or cotton-rat brain.[8 9] Some hundreds of volunteers have been successfully infected; almost all developed antibodies and none showed any signs of illness as a result of the inoculation. At the same time SABIN [10] has been carrying out parallel studies with viruses grown in tissue-culture and has obtained essentially similar results. Now SABIN is reported [11] to have informed the Ohio Valley section of the Society for Experimental Biology and Medicine that he has developed highly attenuated strains of poliomyelitis viruses for use in a vaccine which is now ready for testing on large numbers of volunteers. SABIN describes the strains as pure virus populations derived from single virus particles; presumably they would therefore be more stable than strains containing a mixed virus population. Experiments [12] with animals suggest that these avirulent viruses may give long-lasting immunity, and SABIN is optimistic about their behaviour in man.

Although there are good theoretical reasons why live avirulent virus vaccines may ultimately prove a better solution than inactivated vaccines, there are likely to be many practical difficulties in testing live-virus vaccines in man. Because of the low incidence of paralytic poliomyelitis, a vaccine trial has required some hundreds of thousands of participants in order to demonstrate a significant effect. It may be some time before the general population will have sufficient confidence to accept live-virus vaccines while there is a risk (although perhaps a very small one) that on repeated passage in man a virus might revert to virulence. Further, a natural reluctance to abandon even a plain-looking bird in the hand for an attractive pair in the bush may make it difficult to recruit enough volunteers for a trial of a live-virus vaccine. These difficulties have not deterred investigators in the U.S.A. or in this country; and as the number of people inoculated with live virus climbs slowly into the thousands and tens of thousands we shall learn whether this is a safe technique leading to a high protective effect. If it is satisfactory the stage of large-scale field trials will be near, and it might then be possible to recruit volunteers from people previously inoculated with Salk vaccine. This would decrease the risk of inoculation with live virus, and might answer the question whether live-virus vaccine would increase the immediate protective power of the Salk vaccine or produce longer-lasting immunity.

Cortisone in Asthma

THE treatment of the chronic asthmatic is still one of the most difficult therapeutic problems of general practice. Nevertheless, more and more of these patients can be relieved of their distressing symptoms if they are fully investigated with the object of aiming treatment accurately. It is no longer enough to try a succession of bronchial relaxants and make a desultory attempt to control exposure to a few common allergens—hoping for success. We now know that, especially in the young,

1. Francis, T., Korns, R. F. *Amer. J. med. Sci.* 1955, **229**, 603.
2. See *Lancet*, 1955, ii, 1279.
3. *Publ. Hlth Rep., Wash.* 1955, **70**, 738.
4. Technical Committee on Poliomyelitis Vaccine. *Amer. J. Hyg.* 1956, **64**, 104.
5. Salk, J. E. *Amer. J. publ. Hlth*, 1955, **45**, 575.
6. Wolf, A. M., Shaugnessy, H. J., Church, R. E., Milzer, A., Janota, M., Oppenheimer, F., Morrissey, R. A., Naftulin, H., Chapman, J. W., Levinson, S. O. *J. Amer. med. Ass.* 1956, **161**, 775.
7. Koprowski, H., Jervis, G. A., Norton, T. W. *Amer. J. Hyg.* 1952, **55**, 108.
8. Roca-Garcia, M., Koprowski, H., Jervis, G. A., Norton, T. W., Nelson, T. L., Cox, H. R. *J. Immunol.* 1956, **77**, 123.
9. Koprowski, H., Norton, T. W., Jervis, G. A., Nelson, T. L., Chadwick, T. L., Nelsen, D. J., Meyer, K. F. *J. Amer. med. Ass.* 1956, **160**, 954.
10. Sabin, A. B. *Amer. J. med. Sci.* 1955, **230**, 1.
11. *New York Times*, Oct. 7, 1956.
12. *Ibid*, Oct. 8, 1956. See *Lancet*, Oct. 13, 1956, p. 791.

asthma is often caused by sensitivity to a specific allergen, and that if this is identified and avoided, or desensitisation to it is undertaken, symptoms may disappear and drugs become unnecessary. Even in those commoner cases where there is sensitivity to more than one allergen, desensitisation may have a similarly happy outcome. When these possibilities have been explored, there is a place for the use of bronchial relaxants for the patients who yet have their symptoms. A small and important group are those in whom asthma comes on rapidly late in life and in whom the prognosis is poor.

The success often attending the proper use of corticosteroids in the treatment of other allergic conditions held out a hope that these would be equally effective in allergic asthma; and this has stimulated the Medical Research Council to launch clinical trials of the value of cortisone in chronic asthma and in status asthmaticus. (So far as possible, chronic bronchitics were excluded, and did not form a group in these trials; which, though readily understandable, one cannot help regretting, since they are so numerous and so often disabled.) The reports which we publish this week confirm the impressions previously gained by clinicians working separately. Chronic asthmatics treated with cortisone improve during the first couple of months, but thereafter the benefit is not maintained and they seem no better than others treated along usual lines. (Moreover a difficulty sometimes arises in persuading them to consent to the withdrawal of cortisone.) In the treatment of status asthmaticus there is clear evidence in favour of cortisone; bronchial obstruction was cleared more quickly and more effectively than by conventional methods. Readers will note, however, that most of the patients admitted to hospital were adequately controlled during the first twenty-four hours by these conventional methods, and therefore never entered the trial, which was reserved for those who did not improve. In both investigations cortisone was administered in addition to the use of bronchial relaxants and other measures commonly employed.

Thus, experience has shown that cortisone has a place in the treatment of asthma, especially in the control of the occasional acute seasonal episodes in patients who are resistant to other forms of therapy and in patients with severe status asthmaticus. It also has a place in the treatment of the small group of patients whom we have mentioned as developing intrinsic asthma in later life. The amount of cortisone to be given in cases of chronic asthma has to be found by trial. The routine followed in the M.R.C. investigations was to give 300 mg. of cortisone on the first day, 200 mg. on the second, and 100 mg. on the succeeding four days, after which the maintenance dose was adjusted at an effective level: less than 25 mg. a day is unlikely to be worth giving. In status asthmaticus 350 mg. was given in divided doses on the first day, and 200 mg. on the second, and thereafter the dose was decreased by 25 mg. a day until withdrawal was complete. It is worth emphasising, however, that cortisone has no place in the routine treatment of every case. A reminder that the prolonged administration of this powerful drug may be attended by harmful side-effects should be unnecessary.

Triiodothyronine for "Metabolic Insufficiency"

A LOW basic metabolic rate does not necessarily indicate myxœdema. Not only may the B.M.R. be low in anorexia nervosa, in Addison's disease, and in nephrosis, but often its depression cannot be explained in terms of any known organic disorder. MEANS[1] points out that hypometabolism is sometimes seen in perfectly normal people, who have a low B.M.R. just as others have a slow pulse-rate. In such people symptoms do not usually respond to treatment with thyroid extract.

In a careful study of "non-myxœdematous hypometabolism," KURLAND et al.[2] conclude that the commonest complaints are "lethargy, easy fatigability, nervousness, irritability, emotional instability, sensitivity to cold, headache, ill-defined skeletal pain, diminished sexual potency in the male and menstrual irregularity in the female." 4 patients with this syndrome were studied in detail. The B.M.R. varied from −20 to −25%, but radio-iodine uptake and serum-protein-bound-iodine and serum-cholesterol levels were within normal limits. All had previously been treated with thyroid extract, but without benefit. When the patients were given thyroxine they again failed to respond symptomatically and the effect on their B.M.R. was slight. But triiodothyronine, either alone or in association with thyroxine, raised the B.M.R. and abolished the symptoms. (Furthermore, TITTLE[3] has reported 6 cases with B.M.R.s ranging from −28 to −36% which appeared to respond to triiodothyronine but not to thyroid extract.) For these observation's KURLAND et al. put forward several alternative explanations. One is that triiodothyronine may be better absorbed than either thyroid extract or thyroxine. Another is that people with this syndrome have a peripheral insensitivity to thyroxine, either because they cannot convert it to a more active form, or because it cannot penetrate into their cells, or because triiodothyronine is necessary for the metabolism of thyroxine and they cannot make triiodothyronine. Meanwhile, it still has to be demonstrated that people with non-myxœdematous hypometabolism are unequivocally benefited by triiodothyronine; and this would require a rigorously controlled statistical study with the substitution of a placebo for the drug without the knowledge of either patient or observer.

The problem is far from being merely academic. Most patients attending doctors' surgeries (including nearly all who feel they need a "tonic") have one or more of the symptoms attributed to "non-myxœdematous hypometabolism"; and, since it would clearly not be feasible to measure the B.M.R. in all these cases, doctors may wonder whether they should not give triiodothyronine an empirical trial in all patients complaining of lethargy, easy fatigability and the rest. Such a trial is now being encouraged by at least two important pharmaceutical firms, and we have ourselves published advertisements in which they suggested that triiodothyronine should be used for "hypometabolic states" and

1. Means, J. H. The Thyroid and its Diseases. Philadelphia, 1948.
2. Kurland, G. S., Hamolsky, M. W., Freedberg, A. S. *J. clin. Endocrin.* 1955, **15**, 1354.
3. Tittle, C. R. *J. Amer. med. Ass.* 1956, **162**, 271.

"metabolic insufficiency." But though we think that responsible manufacturers have a right to make reasonable claims through our advertisement columns, we preserve our equal right to disagree editorially with what they advise; and this is, we believe, an occasion for sharp disagreement. Our own opinion—strengthened by the letter from Professor ROSENHEIM and his colleagues which we publish this week—is that triiodothyronine should definitely not be used for the purpose now so widely proposed. To put this drug on the market was proper and indeed praiseworthy, for it is probably the best available for myxœdema coma. But its administration to relieve such symptoms as physical and mental sluggishness, irritability, depression, and nervousness is unjustified in the present state of knowledge. In a statement more detailed than anything we have published, one of the firms has grouped these and similarly non-specific symptoms under the title "metabolic insufficiency." This, it is said, "may affect isolated tissues or organs of the body and therefore may not significantly alter the B.M.R." There may be no objective signs or tests by which this syndrome can be recognised, but "the diagnosis of metabolic insufficiency can be readily verified or discounted by a short therapeutic trial." What, in effect, this means is that patients complaining of almost any symptom which has no obvious cause should be given triiodothyronine to see whether they feel any better. Were this advice widely followed, the least that could happen would be a good deal of diagnostic confusion; and serious harm might be done if, for example, people with severe coronary-artery disease were inadvertently treated with large doses. This powerful agent is certainly not one that should be prescribed indiscriminately as a tonic.

Annotations

EXPERIMENTAL HYPOTHERMIA

IN 1957, designated the Geophysical Year, attempts are to be made to establish an artificial Earth satellite. Distinguished scientists are occupying themselves with what may be termed unearthly problems in a spirit of practical optimism far removed from fantasy. It is well to adopt this frame of mind in considering some of the implications of the remarkable studies carried out at the National Institute for Medical Research on golden hamsters during cooling to, and rewarming from, body-temperatures below 0°C.[1,2]

Hamsters deeply anæsthetised by a combination of anoxia, hyperkalæmia, and cold [3] were cooled in melting ice, or in fluid maintained between −5°C and −10°C, until the colonic temperature had fallen below 0°C. These animals had all been without respiration or circulation for many minutes or hours and appeared dead. Some had frozen progressively and were sufficiently rigid to be supported by the neck and tail without collapsing. Others had undergone supercooling—that is cooling below 0°C—without ice formation and were pliable although the internal temperature had fallen below −5°C. Resuscitation was effected from these low temperatures by rewarming the whole body—the most effective method involving a diathermy technique—while applying artificial respiration. The rate of recovery, the number of animals completely reanimated, and the subsequent mortality depended on such factors as the method of resuscitation, the duration of cooling, and the extent of ice formation; but a high proportion recovered completely and survived indefinitely. Remarkable as this is, it is perhaps no less strange that frostbite was rare unless the extremities had been forcibly bent when frozen and rigid.[4]

We already know that the formation of ice crystals in a tissue does not itself do irreparable mechanical damage; but that this damage is largely attributable to the harmful effects of excessive concentrations of electrolytes occurring within the cells themselves, following the withdrawal of water from them as freezing progresses.[5,6] Mammalian cells are in the main freely permeable to water, and consequently, when ice forms around them, give out water so that their contents are maintained at an osmotic pressure close to that of their environment—which has the effect of pickling them in their own more concentrated juices. This effect and its enhancement by the use of 10–20% glycerin as a "salt buffer" has been most clearly demonstrated in work on cell suspensions.[6–11] The administration of glycerin parenterally to hamsters unfortunately produced coma and death, and the protective effect noted in suspensions of spermatozoa or red cells could not be tested. A small amount of propylene glycol introduced in the drinking-water produced a concentration of less than 1% in the circulating blood. This can have had only a very slight protective effect, but this group of animals showed a surprising tendency to supercool rather than to become frozen when placed in the subzero bath.

When the extent to which ice had formed in the tissues was estimated by pansecting hamster bodies differences were noted between various organs, there being a higher proportion in the skin and brain than in the thoracic and abdominal viscera. Further it was found by this and by calorimetric methods that as much as 60% of the water content of the brain and 60–90% of that of subcutaneous fluid could be frozen without prejudicing reanimation; but no animal with more than 55% of the total body-water frozen recovered, and the safe limit seemed to be in the region of 15%. This prevented really low temperatures from being reached, the lowest being −9°C.

Duration of cooling also played a part in determining survival; few hamsters frozen for more than 60 minutes recovered fully. Here the effects of circulatory and respiratory arrest during the unstable periods of cooling and rewarming must be taken into account and certain limits recognised.

The body-temperature of a whole animal can be altered only slowly, on account of its size, its high heat capacity, and the poor conductivity of its skin. The time available for such temperature changes is determined by the survival-time with circulatory and respiratory arrest at temperatures around 0°C. Added to this is the problem of the differences in temperature between different organs during cooling and in their individual susceptibility to damage. Necropsies on those animals not surviving the procedure and on apparently well survivors revealed, among various ill-defined pathological conditions, gastric hæmorrhages or ulceration as the commonest abnorm-

1. Smith, A. U. *Proc. roy. Soc.* B. 1956, **145**, 391, 407.
2. Lovelock, J. E., Smith, A. U. *Ibid*, p. 427.
3. Andjus, R. K., Smith, A. U. *J. Physiol.* 1955, **128**, 446.
4. Smith, A. U. *Lancet*, 1954, ii, 1255.
5. Lovelock, J. E. *Biochim. biophys. Acta*, 1953, **10**, 414.
6. Lovelock, J. E. *Ibid*, 1953, **11**, 28.
7. Polge, C., Smith, A. U., Parkes, A. S. *Nature, Lond.* 1949, **166**, 668.
8. Smith, A. U. *Lancet*, 1950, ii, 910.
9. Lovelock, J. E. *Nature, Lond.* 1954, **173**, 659; *Biochem. J.* 1954, **56**, 265; *Proc. R. Soc. Med.* 1954, **47**, 60.
10. Parkes, A. S., Smith, A. U. *Proc. roy. Soc.* B. 1953, **140**, 455; *Acta endocr., Copenhagen*, 1954, **17**, 313.
11. Smith, A. U. Effects of Low Temperatures on Living Cells and Tissues. *In* Biological Applications of Freezing and Drying. New York, 1954.

alities. These, it is thought, may be manifestations of an alarm reaction, sharing a common origin with ulcers accompanying burns or other trauma; but alternatively ischæmia may be primarily responsible, or cold may have a specific effect. These animals had not at any time been in a steady state of suspended animation. To achieve that state the temperature would have had to be reduced to very low levels in order to avoid a wide variety of deleterious biophysical and biochemical changes not halted at temperatures around 0°C. The workers at the National Institute suggest that some means of permeating the animal with glycerin or propylene glycol must be found before suspended animation becomes possible.

Perhaps this extreme state may always elude us; but it is now clear that living mammals can withstand cooling not only until breathing and heart-beats have been at a standstill for many minutes, but until ice has formed in the peripheral tissues and until the whole body is sufficiently frozen to be rigid, and further that frostbite need not accompany this process.

Obviously this work cannot be immediately applied to man. Nevertheless from it must come a reappraisal of our thinking about cold and its effects; and medicine stands in considerable debt to this group of investigators, who have swept away many misconceptions.

MISDIAGNOSIS OF ARTERIAL DISEASE

A PATIENT complaining of pain in the calf on walking, which is rapidly relieved by rest, is not likely to have vascular disease overlooked. But when the pain is in an unusual site the possibility of its being caused by arterial disease may not be thought of; and Bonney [1] reports 9 cases, seen in the past four years at one of two hospitals, in which pain in the buttock or thigh was demonstrably caused by aortic or iliac-artery occlusion. In each of these cases osteo-arthritis of the hip or vertebral-disc degeneration had previously been diagnosed, and the patients had been treated accordingly. One common source of mistaken diagnosis is failure to realise that thrombosis of a major proximal artery is not necessarily associated with absent ankle pulses when the patient is at rest, although these will invariably disappear on walking until the onset of pain. The exercise pain, which may be felt anywhere in the upper leg or low back, is usually associated with severe fatigability of the limb and general muscle wasting. Nor has Bonney exhausted the vagaries of diagnosis in degenerative vascular disease. Aneurysms of the aorta may present as palpable swellings, acute or chronic abdominal pain, hæmaturia, or backache: aneurysms in the groin as abscesses, and at the back of the knee-joint as an ache simulating osteo-arthritis. Tissue wasting in the sole of the foot due to peripheral ischæmia may be wrongly ascribed to painful flat feet and the foot manipulated; claudication in the small foot muscles may be misdiagnosed as metatarsalgia, and the pain in the os calcis, unprotected by its fibro-fatty covering, ascribed to a spur. Sepsis in the bed of the nail can be confused with an ingrowing toenail, with disastrous results. Ischæmic nerve palsies are not uncommon.

Simple clinical observation will usually confirm or exclude arterial disease. Colour changes, vein guttering on elevation, tissue wasting, and temperature differences are all helpful. Oscillometry may confirm the presence of ischæmia, as will re-examination immediately after exercise. Arteriography should be reserved for cases in which grafting is contemplated. As Bonney points out, mistakes in diagnosis may not only involve a delay in treatment but also cause deterioration in the condition of the limb through the application of over-energetic physiotherapy or through surgical trauma. Prompt diagnosis is more than ever important now that arterial surgery can offer many of the patients with disease of major vessels relief from pain with only a moderate risk.

1. Bonney, G. *J. Bone Jt Surg.* 1956, **38B**, 686.

SURGERY FOR SPINAL TUBERCULOSIS

IN Russia, as elsewhere, conservative measures alone have proved inadequate for the complete cure of tuberculous spondylitis; and the optimism of the early streptomycin days has not been sustained. Russian surgeons seem to concentrate mainly on psoas abscesses and to aim at complete excision of the abscess and capsule—a more radical procedure than is usual in this country. On the other hand, British surgeons seem to tackle mediastinal abscesses more often than their Russian colleagues.

These comparisons are prompted by Kirilov and Kon's recent paper, [1] from the B.M. Molotov Bone Tuberculosis Sanatorium, on the surgical treatment of hypostatic abscesses in tuberculous spondylitis. Of 298 patients with tuberculosis of the vertebræ, 288 had abscesses. Up to two years ago treatment consisted of a "sanatorium cum orthopædic" régime. Since then 30 patients with psoas abscesses have been operated on; in 5 the operation was bilateral, in 22 a partial excision was performed, and in 8 a radical excision of the abscess and capsule was completed. The technique included postoperative drainage and the local instillation of streptomycin. In all but 4 patients the tuberculous process became inactive, and 20 out of the 30 patients have been discharged from hospital with quiescent lesions. Shulutko and Elochina,[2] of the Sverdlovsky Children's Tuberculosis Sanatorium, report that 17 operations have been performed on 14 children with tuberculosis of the spine; 13 had lumbar lesions and 1 thoracic. In the lumbar region, radical excision of the abscess and capsule was the operation of choice. 2 patients have been completely discharged and 4 have been allowed to get up and walk.

THIRTY-FIVE YEARS OF NEUROLOGY

IT was in 1920 that *Guy's Hospital Gazette* announced the appointment as assistant physician for nervous diseases of the distinguished neurologist who retired from the active staff of the hospital last year. The editors of *Guy's Hospital Reports* have recently marked the retirement of Sir Charles Symonds by dedicating to him a collection [3] of papers on various neurological subjects. Written by members of the Guy's medical school staff, these papers provide an illuminating commentary upon the ramifications of contemporary research into the nervous system.

Three of the ten papers can fairly be classified under the heading of neurochemistry—a recent but lusty neophyte in the neurological hierarchy—but the morphology, immunology, and experimental pathology of the nervous system are also represented; and there is a fitting clinical touch in an article by I. C. K. MacKenzie on multiple sclerosis. Among the neurochemical contributions, the review by K. P. Strickland on "energetics and cerebral metabolism" shows clearly the relevance of the ideas of modern dynamic biochemistry to an understanding of how neurones are powered by complex sequences of enzyme reactions which permit the graded liberation of the chemical energy of glucose. R. H. S. Thompson and G. R. Webster carry the study of enzyme mechanisms into the field of pathology, by indicating how recent investigations on the detailed chemistry of the lipids of the nervous system and the enzymes which act upon them give promise for the ultimate elucidation of the process of demyelination, which, though it has long occupied a central place in neuropathology, has remained essentially a histological concept. J. Dobbing and B. McArdle stay on the fringe of neurochemistry. Dobbing discusses the blood-brain barrier, which,

1. Kirilov, B. P., Kon, I. I. *Surgery, Moscow*, 1956, **5**, 53.
2. Shulutko, M. L., Elochina, N. P. *Ibid*, 1956, **6**, 62.
3. *Guy's Hosp. Rep.* 1956, **105**, no. 1.

like the phenomena of demyelination, is advancing from the stage of recognition on the basis of staining reactions to that of a quantitative problem in membrane kinetics. McArdle's review of disturbances of carbohydrate intermediates in nervous disorders is a laudable attempt to relate fundamental biochemical discoveries to certain clinical neuropathies; but in its present context it tends to bring out the difficulties rather than the successes of such extrapolations. On the more secure ground of experimental pathology, G. Payling Wright discusses the dissemination of toxins and viruses in the nervous system and summarises the elegant work that he and his collaborators have done on the spread of tetanus toxin. Immunology is represented by a paper on allergic encephalitis by J. B. Cavanagh; and some recent morphological studies are reviewed by J. Joseph. Finally, G. A. Thomas describes the use of tissue-cultures in the study of the nervous system and gives an exciting picture of the possibilities opened up by the successful application of this technique to neurones and neuroglia.

While these papers single out many of the growing-points of neurobiology (a term used in the title of a recent monograph), progress in other branches of neurology since 1920 has been no less spectacular. It is true that Sherrington's monumental lectures [4] on the integrative action of the nervous system had been published in 1906, and that Keith Lucas's lectures,[5] which formed the foundation of his book on the nerve impulse, had been delivered in 1914 and published in 1917; but the electrophysiological work of Adrian and Bronk [6] and of Erlanger and Gasser,[7] bringing experimental study down to the level of individual nerve-fibres and fibre-types, had yet to come. Moreover, it was not until 1938 that a special *Journal of Neurophysiology* was launched. Thus, although neurophysiology has a venerable history by comparison with neurochemistry (whose journal only began in 1956) it is still a relatively new subject. The stretch reflex was described as recently as 1924 [8]; and anything approaching a complete picture of the spinal mechanisms concerned in posture was achieved only in the 1930s and 1940s through the researches of Matthews [9] and Leksell [10] on the muscle afferents and small-fibre efferents respectively. Of more immediate clinical interest, though closely related in methodology to the advances in pure physiology, is electro-encephalography, which, since the original observation of brain-waves by Berger in 1929,[11] has evolved into a flourishing sub-specialty. Within the last decade the work of Hodgkin [12] and his associates at Cambridge on the ionic basis of nervous conduction has brought electrophysiology into the ambit of electrochemistry, and what Sherrington described in functional terms as the central excitatory and central inhibitory states are now being interpreted as quantitative changes in ionic distributions across the neuronal membrane.[13]

The changed prognosis of tuberculous meningitis is a matter of recent history, but Symonds was practising neurology at the time when subacute combined degeneration of the cord became a tractable disease, and he has seen dramatic progress in the surgical side of his specialty, with corresponding improvement in the prospects for patients with cerebral neoplasms and head injuries, to the study of which he has himself made many contributions. Diagnostic aids have likewise grown since Dandy [14] made the first ventriculograms in 1918 and Moniz [15] the first cerebral angiograms in 1927. Symonds himself has long given proof of the existence of neuropsychiatry as a conjoined discipline, and in this field his term at Guy's has seen the introduction of many physical methods of treatment and very recently the apparently successful chemical attack on phenylketonuric oligophrenia [16]; while it is conceivable that the more speculative but highly intriguing suggestion [17] of a specific biochemical disorder as the essential cause of schizophrenia may soon provide another landmark. Early in his career Symonds was much concerned with encephalitis lethargica,[18] and the prospect of effective immunological attack upon virus diseases of the nervous system has lately been brought nearer by the poliomyelitis vaccines.

It has been said that clinical neurology is largely a study in the applied anatomy and physiology of the nervous system. The last thirty-five years have seen a perceptible shift in the proportions of these ingredients.

4. Sherrington, C. S. Integrative Action of the Nervous System. Newhaven, Conn., 1906.
5. Lucas, K. The Conduction of the Nervous Impulse. London, 1917.
6. Adrian, E. D., Bronk, D. W. *J. Physiol.* 1928, **66**, 81.
7. Erlanger, J., Gasser, H. S. Electrical Signs of Nervous Activity. Philadelphia, 1937.
8. Liddell, E. G. T., Sherrington, C. S. *Proc. roy. Soc.* B. 1924, **96**, 212.
9. Matthews, B. H. C. *J. Physiol.* 1931, **71**, 64.
10. Leksell, L. *Acta physiol. scand.* 1945, **10**, suppl. 31.
11. Berger, H. *Arch. Psychiat.* 1929, **87**, 527.
12. Hodgkin, A. L. *Biol. Rev.* 1951, **26**, 339.
13. Eccles, J. C. The Neurophysiological Basis of Mind. Oxford, 1953.
14. Dandy, W. E. *Ann. Surg.* 1918, **68**, 5.
15. Moniz, E. *Rev. Neurol.* 1927, **2**, 72.
16. Bickel, H., Gerrard, J., Hickmans, E. M. *Lancet*, 1953, ii, 812.
17. Osmond, H., Smythies, J. *J. ment. Sci.* 1952, **98**, 309.
18. Symonds, C. P. *Quart. J. med.* 1921, **14**, 283.
19. See *Lancet*, Sept. 15, 1956, p. 561.
20. Raventós, J. 20th International Physiological Congress, Abstracts of Communications. Brussels, 1956; p. 754.
21. Johnstone, M. *Brit. J. Anæsth.* 1956, **28**, 392.
22. In the Mental Hospital. Obtainable from THE LANCET Office, 7, Adam Street, Adelphi, London, W.C.2. Pp. 72. **2s. 6d.** (postage 4d.)

NON-EXPLOSIVE ANÆSTHETICS

THE early clinical reports of trifluoroethylvinyl ether ('Fluoromar') as an anæsthetic [19] have been quickly followed by work on a new fluorinated compound. Fluoromar falls short of expectations because it is not completely non-inflammable. The new compound, a halogenated hydrocarbon, 2-bromo-2-chloro-1 : 1 : 1 : trifluoroethane ('Fluothane') is a British product and has no such disadvantage, since it is non-explosive and non-inflammable when mixed in high concentration with oxygen. Experiments show [20] that fluothane is a potent drug with few toxic effects, and the first clinical report is optimistic.[21] Much investigation remains to be done, but on the whole this is a promising start for a new anæsthetic agent.

"IN THE MENTAL HOSPITAL"

A YEAR ago Dr. J. A. R. Bickford set out to "indicate how bad conditions in mental hospitals arise and are perpetuated, and then to show that major difficulties can be overcome, and major reforms achieved, without much extra expenditure." His two articles were strongly attacked, and defended; and we thought it would be useful to publish under the same general heading some further articles in which other workers offered their experience and opinions. All these contributions came to us spontaneously, and their subjects range from the "rise and fall of mental nursing" to occupational therapy on the Continent and the effects of "institutionalisation" on patients. But all, to a greater or less extent, are concerned with the value of occupation and work for mental patients and the means whereby it is best provided; and the series, as now reprinted without alteration,[22] will we believe be found as informative as it is stimulating.

Lord NUFFIELD has given the Faculty of Dental Surgeons of the Royal College of Surgeons of England £100,000 to establish a chair of dental research in the department of dental science which is to be housed in the laboratory block now being built at the college.

Dr. J. W. TREVAN, F.R.S., formerly director of the Wellcome Research Laboratories, Beckenham, died on Oct. 13 at the age of 69.

Dr. A. H. GALE, director of postgraduate studies in the University of Bristol, died on Oct. 12.

Special Articles

MANAGEMENT OF AN ARTERY-GRAFT BANK

WITH SPECIAL REFERENCE TO STERILISATION BY β-PROPIOLACTONE

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THERE has been a decline in the popularity of the homologous artery graft, yet, in discussion, surgeons still speak of a need for it. The low cost, accessibility, and versatility of substitutes for arterial grafts—e.g., 'Orlon,' polyvinyl sponge, and other plastics (Kinmonth et al. 1955, Shumway et al. 1955, Rob et al. 1956)—has not been the main reason for this decline. The real reason is, perhaps, that it is difficult to obtain and sterilise sufficient specimens of arteries.

It is essential that homologous artery grafts should be free from arterial disease, transmissible disease, and infection. Early necropsy after death from trauma has been considered the most suitable and, perhaps, the only occasion when these criteria can be fulfilled, since early removal of the specimen, under strict aseptic precautions, is necessary to get a graft in a good state and most likely to be free from infection.

In practice these conditions are hard to fulfil, and the occasional venture that is successful is not good enough for building up and maintaining a bank of grafts in a big centre, since all varieties must be available for dispatch to other hospitals and for use in the histological and bacteriological control of the methods of preservation.

A further difficulty in the management of a bank has been the realisation that contamination of arteries, such as the aorta and the iliac arteries, from the bowel is rapid, rendering collection of a sterile graft virtually impossible. The aqueous continuity existing in the body after death allows organisms, particularly *Escherichia coli* and *Clostridium welchii*, to contaminate these vessels within an hour; hence for practical purposes all specimens must be regarded as infected. (Bacteria may be present in and around the abdominal and thoracic vessels for some days before death from non-traumatic conditions.)

Sterilisation of the grafts has been an added difficulty. Ethylene oxide (Hufnagel et al. 1953) in a 1% solution is explosive and toxic (boiling-point 10·7°C) and must be handled in a special "cold room" at +4°C. Antibiotics have been used (Fisher et al. 1956), but bacteriological control with them is incomplete, and the hazard of infection by resistant strains is not removed.

Since the Birmingham bank has made use of 1% β-propiolactone (Lo Grippo et al. 1955), it has become possible to ignore altogether the question of sterility at the time of collection of the specimens. Thus the technique of collection has been simplified and the time between death and collection is now relatively unimportant, at least up to 24–36 hours in cold storage. Only cases with atherosclerosis or neoplastic disease, or with tuberculosis and other specific infective diseases, are avoided.

β-Propiolactone

β-Propiolactone * is a liquid (sp. gr. 1·146 at 20°C) which is miscible with water to the extent of 37% by volume at 25°C. In the concentrated form, stored in glass containers at 5–10°C, it is stable; but in the presence of strong acids, alkalis, and certain inorganic salts explosive polymers can be formed. In its concentrated form it is toxic to tissues, causing denaturation; hence contact of the fluid and its vapours with the skin must be avoided. In the diluted form at room-temperature it hydrolyses rapidly, producing non-toxic degradation products. For this reason working solutions are prepared in ice-cold water and all procedures are carried out rapidly.

These characteristics are the basis of its use, because a 1% solution is safe to handle, causes little denaturation of tissue, kills bacteria and viruses, and then destroys itself by hydrolysis. Lo Grippo et al. (1955), who used a 1% solution, cite a bactericidal range of 0·1–0·2% for vegetative cells and up to 0·75% for desiccated spores.

Research Problems

The following programme was devised to substantiate the results of Lo Grippo et al. (1955) and to observe whether complete bacteriological control can easily be achieved:

(1) Bacteriological examination of all arterial grafts at the following stages: during collection, before sterilisation, after sterilisation, and after storage (in one of three ways: freeze-dried, deep-frozen, or immersed in physiological salt solution).

(2) Investigation of the germicidal properties of β-propiolactone on different organisms (including some isolated from necropsy material) grown in standard broth media.

(3) Investigation of the keeping qualities of β-propiolactone stored at refrigeration temperature, by comparing its potency towards cultures of *Cl. welchii* and *Esch. coli* grown in a standard culture medium for some weeks.

Method

A 1% solution of β-propiolactone is prepared by first making up a 10% solution in ice-cold water (2·2 ml. of conc. β-propiolactone diluted to 25 ml.). This is rapidly diluted to 1% with saline-bicarbonate buffer solution. The saline-bicarbonate buffer solution is necessary because the hydrolysis products of β-propiolactone tend to lower the pH. A solution of 0·2*M* sodium bicarbonate in physiological saline solution is sufficient to maintain the pH between 6·5 and 7·0 during incubation.

The treated arteries are placed in the incubator at 37°C for two hours. Sterilisation is effected, and the reagent hydrolyses completely to non-toxic products. These degradation products are no longer bactericidal; consequently all future manipulations of the grafts should be done under strict aseptic conditions. The mouths of the tubes (6 in. by 1 in. rimless) containing the grafts are flamed, and the grafts are washed in sterile salt solution, sterile gauze covers are applied, and the grafts are ready for storage.

Cultures of the washings are made at each stage and sent for examination to the department of bacteriology.

Experimental

Bacteriological Examination of Saline Washings on Primary Media

Cooked-meat medium ('*Oxoid*').†—One tablet was dissolved in 10 ml. of distilled water in a McCartney culture bottle and sterilised by autoclaving at 15 lb. for 20 min. (final pH 7·4). Anaerobic cultures in this medium were incubated at 37°C.

* In the early work described here the reagent supplied by B. F. Goodrich and Company, Ohio, U.S.A. (agents: Messrs. Honeywell & Stein, London) was not easily obtainable. Samples were therefore obtained from British firms, whose products were probably also of American origin.

† These media may be obtained in tablet form from Oxo Ltd.

TABLE I—EFFECT OF 1% β-PROPIOLACTONE ON VARIOUS ORGANISMS IN VITRO

Organism	7-day culture
Staph. aureus	No detectable growth
Group-A streptococcus	,,
Cl. welchii	,,
Cl. septique	,,
Cl. tetani	,,
Cl. oedematiens	,,
Bacillus subtilis	,,
A sporing aerobic bacillus*	Growth
Strep. faecalis †	No detectable growth
Esch. coli †	,,

* This organism is included in this series because it was the only organism present in an original artery graft which survived treatment with 1% β-propiolactone.

† These organisms had previously been isolated from necropsy material before treatment with β-propiolactone.

Nutrient broth.†—5 ml. amounts of nutrient broth were distributed in test-tubes measuring 5 in. by $^5/_8$ in. and sterilised by autoclaving at 15 lb. for 20 min. (final pH 7·4). Primary cultures in this medium were incubated aerobically at 37°C.

The saline washings from the arteries and grafts were centrifuged, and the deposits were inoculated into each of the primary media. Subcultures were made on McConkey's agar and on blood-agar and were incubated either aerobically or anaerobically according to the primary cultures. Isolated colonies were picked off and, where possible, identified.

Examination of the saline washings of arteries obtained at necropsy showed a mixed bacterial flora consisting of the following types: *Streptococcus faecalis, Esch. coli, Pseudomonas fluorescens*, non-pathogenic staphylococci, and aerobic spore-forming bacilli. These last are all presumptive saprophytes.

Effect of 1% β-Propiolactone on Various Organisms in Vitro

10 ml. of a 2% solution of β-propiolactone was added to 10 ml. quantities of 24-hour cultures of the organisms listed in table I, grown in cooked-meat media. This gave a final concentration of 1% β-propiolactone. The mixtures were incubated for 2 hours at 37°C, and 0·5 ml. amounts were transferred into fresh cooked-meat medium and incubated at 37°C. Table I records the findings after 7 days' incubation.

Effect of Storage of β-Propiolactone at +4°C on its Bactericidal Potency

Cultures of *Esch. coli* and *Cl. welchii* in standard cooked-meat media were treated with different concentrations of β-propiolactone at intervals for some weeks.

TABLE II—EFFECT OF REFRIGERATION ON BACTERICIDAL POWER OF β-PROPIOLACTONE

Strength of β-propiolactone (%)	*Esch. coli*							*Cl. welchii*						
	Length of storage at +4°C (weeks)													
	0	0·5	2	4	5	7	10	0	0·5	2	4	5	7	10
0·05	..	..	..	+	+	+	+	..	..	..	+	+	+	+
0·10	+	..	..	+	+	+	+	+	..	..	+	+	+	+
0·15	..	..	..	+	+	−	−	..	..	..	−	+	+	+
0·20	+	..	..	−	+	−	−	+	..	..	−	+	−	+
0·25	..	..	..	−	−	−	−	..	..	..	−	−	−	−
0·30	+	+	−	−	−	+	+	+	+	−	−	−	−	−
0·35	..	+	−	−	+	+	−	..	+	−	−	−	−	−
0·40	+	+	−	−	+	+	+	+	+	−	−	−	−	−
0·45	..	+	−	−	+	−	−	..	+	−	−	−	−	−
0·50	−	−	−	−	+	−	−	−	+	−	−	−	−	−
0·55	..	−	−	..	−	−	−	..	+	−	..	−	−	−
0·60	−	−	−	..	+	−	−	−	−	−	..	−	−	−
0·65	..	−	−	..	..	..	..	..	−	−	..	..	..	..
0·70	−	−	−	..	..	..	..	−	−	−	..	..	..	..
0·75	..	−	−	..	..	..	..	..	−	−	..	..	..	..
0·80	−	−	−	..	..	..	..	−	−	−	..	..	..	..
0·85	..	..	..	..	..	..	..	..	..	..	..	..	..	..
0·90	−	..	..	..	..	..	..	−	..	..	..	..	..	..
0·95	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1·00	−	..	..	..	..	..	..	−	..	..	..	..	..	..

\+ growth. − no detectable growth.

At first the dilutions were made over the range 0·1–1·0% β-propiolactone, but subsequently the scale was expanded around what appeared to be the critical concentration for the organisms under test.

Table II summarises the findings in these experiments up to ten weeks' storage.

The reasons for the variable results with *Esch. coli* are not yet known. Lo Grippo et al. (1955) report similar variations with this organisms and with *Ps. aeruginosa*. The variations may possibly be due to the formation of microcysts or to the alteration in the enzymic activities of *Esch. coli* resulting from its growth under anaerobic conditions. This problem is being investigated.

It is, however, certain that a concentration of 1% β-propiolactone destroys *Esch. coli* and all the other organisms listed in table I except a single strain of a sporing aerobic bacillus (no. 8 in the table), and that the germicidal power is retained for at least 10 weeks.

When the freeze-dried graft, from which the aerobic sporing bacillus was originally isolated, was finally removed from the bank, it was sterile on culture. It is therefore evident that, though this organism resisted a 1% concentration of β-propiolactone under the conditions of test, it did not survive 26 weeks' freeze-dried storage.

Technique of Bank Maintenance

COLLECTION OF GRAFTS

In suitable instances specimens are collected in conjunction with normal necropsy procedure. Gross contamination is avoided. After being washed in sterile physiological saline solution they are put into tubes and stored temporarily in the deep-freeze refrigerator until they are trimmed, measured, and sterilised. Cultures are prepared from the saline washings.

TRIMMING AND REGISTRATION

The tubes are taken from the deep-freeze refrigerator and allowed to return to room-temperature, and sterile physiological saline solution is added (culture taken). Unnecessary contamination being avoided, each specimen is taken out and laid on a sterile towel, and all fat and loose connective tissue is snipped off. Arterial branches are cut short and not ligated (the surgeon or his assistant sutures any branch holes at the time of use of the graft). Measurements of the length and diameters are taken and entered on a card. A drawing is made to indicate the shape of the graft. Remarks are added concerning any branches or branch holes that are present and any other information considered to be of use to the surgeon. These points are especially necessary where freeze-drying is the method of preservation, for dehydration causes shrinkage. The cards containing the information are pinned to a notice-board, so that the whole state and contents of the artery bank (at present 53 grafts) can be seen at a glance, and anyone needing a graft urgently will have no difficulty in finding what he requires. Directions for the reconstitution and use of grafts are also affixed.

STERILISATION WITH β-PROPIOLACTONE

Being ready for sterilisation the grafts are placed in sterile tubes and incubated with 1% β-propiolactone as already described.

PRESERVATION AND STORAGE

Deep-freeze Refrigeration

Preservation by deep-freeze refrigeration (Eastcott and Hufnagel 1950) was started in 1953 on the lines of the first bank at St. Mary's Hospital. The insulation of half of a commercial deep-freeze refrigerator was modified so that, with a packing of carbon-dioxide ice, a temperature of −70°C is obtained. Daily topping up with this 'Cardice' and occasional maintenance have kept this

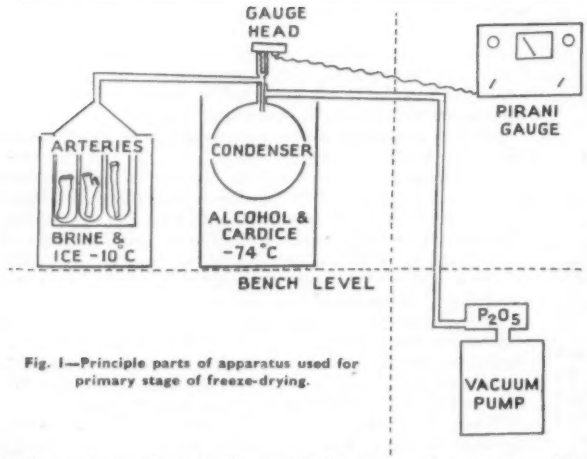

Fig. 1—Principle parts of apparatus used for primary stage of freeze-drying.

equipment running continuously for more than three years. (The other half of the deep-freeze refrigerator is used for storing skin and bone at –20°C.) The danger of frostbite necessitates the wearing of leather gloves when handling cardice and the tubes containing the grafts. When a graft is required, the tubes are removed from the deep-freeze refrigerator and allowed to warm up to room-temperature over half an hour. Before use the caps are removed and sterile saline solution is added (culture then taken). As a safeguard against contamination in the operating-theatre streptomycin 2 g. and penicillin 2,000,000 units are added to the saline solution containing the graft.

Freeze-drying

Freezing of the grafts and drying in high vacuum (Eastcott et al. 1954) are done in two stages. About 98% of the water in the tissue can be shown to be extracted. In the primary drying stage, using a vacuum of 1–0·5 mm. Hg measured with a Pirani gauge, most of the water is removed. A cold condenser unit is used to avoid swamping the pump unit (fig. 1). In secondary drying the system is evacuated to a greater vacuum (0·05–0·01 mm. Hg), the small amount of remaining water being taken up by the phosphorus-pentoxide trap (no condenser is necessary) (fig. 2).

Primary drying.—The mouths of the tubes containing the sterile grafts are covered with sterile gauze. Two-thirds of each tube is immersed in a mixture of alcohol and solid carbon dioxide (quick deep-freezing to –70°C).

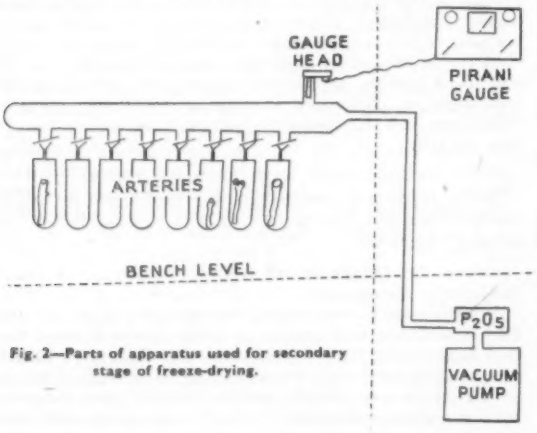

Fig. 2—Parts of apparatus used for secondary stage of freeze-drying.

The tubes are then transferred to the drying chamber of the apparatus, surrounded by brine and ice at –10°C. The apparatus is assembled, the joints are sealed with 'Q compound' (Metro Vic), and the vacuum pump is started. Further sealing of the joints is required to overcome leaks to obtain the Pirani-gauge reading mentioned above. Primary drying lasts for 2–3 days.

Secondary drying.—Before secondary drying, the tubes are sealed with sterile rubber caps, on top of which is placed melted picien wax. While this is still soft it is swabbed with alcohol, and a sterile aspirating needle is plunged through wax and cap. In the actual drying the drying manifold (fig. 2) is connected up to the apparatus, and all joints are sealed to prevent leaks. The tubes are connected to the manifold via the inserted needles and modified syringe fittings. With the stopcocks closed, the system is evacuated to a pressure of 0·01 mm. Hg or better. The stopcocks are then opened, the sudden change of pressure being sufficient to clear the needle if it has become blocked with rubber or wax and to pull the cap on to make a good seal. Secondary drying lasts for 2–3 days. The tubes are sealed for storage by closing the stopcocks, pulling the tube and cap off the needle, and sealing with more wax. The hard wax is brittle; so a 'Viscap' is placed over it to give protection.

Of good keeping properties the freeze-dried graft can be sent anywhere, but with grafts preserved by other means a state of –70°C (deep-frozen) or +4°C (either physiological salt solution or formalin) should be maintained. The freeze-dried grafts are reconstituted by removing the viscap and wax and, after swabbing the rubber cap with alcohol, plunging through a needle which is connected to a supply of sterile saline solution. (Antibiotics are added as described above.) At least half an hour must be allowed for the graft to reconstitute. (The grafts will go on taking up water for a further hour and a half.) Properly reconstituted they are satisfactory to use.

In Physiological Saline Solution

After sterilisation the grafts are washed with sterile saline solution, and then Hanks's solution (Gross et al. 1949, Lo Grippo et al. 1955) is added. These grafts are left in the refrigerator at +4°C. After about 2 months the indicator used in the solution may change colour, the grafts remaining sterile.

In Formalin

Without β-propiolactone a few short lengths of grafts have been preserved in 4% formalin at pH 5·6 as advocated by Nuboer (1954) and Moeys et al. (1954). Storage should be in the dark at 4°C and is limited to 6 months. The grafts must be washed in saline solution for 24 hours before use.

Summary

The homologous artery graft is not so popular now. The cause is not merely the ease of use and low cost of the plastic graft but also the difficulty of obtaining and making sterile homologous grafting material.

This difficulty is overcome by using β-propiolactone.

The experimental work that has been, and still is, necessary to ensure the safety of the artery bank is described, together with the collection of specimens and their preservation by deep-freezing, freeze-drying, storage in physiological saline solution, and storage in formalin.

REFERENCES

Eastcott, H. H. G., Holt, L. B., Peacock, J. H., Rob, C. G. (1954) *Lancet*, i, 1311.
— Hufnagel, C. A. (1950) Surgical Forum. Philadelphia; vol. 1, p. 269.
Fisher, B., Adams, C., Wilde, R., Fisher, E. R., Dattilo, J. (1956) *Ann. Surg.* **143**, 73.

References continued at foot of next column

A HOSPITAL VISITORS' ASSOCIATION*

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I HAD been at Middlewood Hospital for about six months when a geriatric unit for 310 patients was started. One of our greatest difficulties with this unit was that 80 patients had no visitors at all and another 40 saw their relatives perhaps only once in six months. Our patients came from a wide area, stretching to thirty miles from the hospital, and lack of transport kept many visitors away. As the patients grew older, so did their spouses; the objections to travel increased, and the urge to visit dwindled.

As I was considering how I could arrange for the lonely patients to be visited, I remembered what had been done at Warlingham Park by bringing the relatives together. I noticed that visitors seemed to assuage their own suffering by helping patients who appeared neglected: I often saw them passing round cigarettes to those who were not visited, and even chatting with them; but they felt a bit shy of doing this, and wondered whether it was right to do so. So we decided to set up a visitors' association.

FIRST STEPS

I began by discussing the idea with the sisters and charge nurses. This was a most important step. Continuously I was being badgered by, "Well, I don't know anything about it. I'm not going to do it," or "You told somebody, but you didn't tell me." I asked them to look through the relatives and see if there were any who were particularly interested; and soon the nurses suggested a secretary who was well used to such work and who had spoken to sister, asking if he could help. I rang him up and asked if he would be secretary. He was delighted to do so.

The inaugural day was arranged for a visiting day, and a display of occupational therapy was held to attract some more people to come. At the meeting I described roughly the sort of work that was wanted and explained that though it was the unvisited patient who so badly needed help, all patients would benefit from improved ward decorations and more outings. We decided that the aims of our association should be to visit the unvisited patients, to provide comforts, to provide birthday gifts, to provide entertainments and outings, and to increase the liaison between the hospital staff and the visitor.

Though I asked the hospital chaplain if he would be chairman, it is important not to have an executive committee mainly made up of hospital staff. Our committee was formed from relatives from each ward. The chief male nurse, the matron, and I used to go along as guests and to help in any way we could. At the first meeting I sent two lists round and asked those willing to visit another patient to put their name on one list, and those who had their own cars to put their names on the other list. Afterwards I wrote to all relatives who had not visited for some time, mentioning the meeting, and 20 who had lost interest came along and began to visit again.

The minutes from each meeting of the association were put on ward notice-boards. I felt it was important for the work to be known in the wards, not only by the other relatives who were coming but also by the nurses. It is important for the nurses to feel that they are very much a part of this work, and it does concern the good job they are doing.

HELPING OUR VISITORS

In mental hospital life sometimes tends to be a bit rowdy, and people from the voluntary organisations are sometimes upset by the atmosphere in the chronic wards. So we find that most help comes from relatives who already visit. Patients who only have one visitor would be distressed if they were asked to share that visitor, so only where two or three people come to one patient are they asked to talk to another. Of course, all our lonely people were not suitable to be visited. So we divided the patients into three groups. The first group knew what they were talking about and we tried to get them visited individually. The second group were not so bright, and we arranged these in groups of four and asked one person to visit the group. Patients who are totally demented are not suitable to be visited by anyone except their own relations. Volunteer visitors will soon be discouraged if asked to sit with a silent patient. Much care was needed on this point to maintain the volunteer's interest.

At our second monthly meeting there were still some patients who were not being visited; so I wrote to the churches, the Women's Voluntary Services, and the Red Cross and asked for volunteers. I had 20 replies; they all came along, and of these 20 at least 12 are still visiting the hospital. As it is important that these people who come from outside really understand the hospital problems, I arranged a meeting for the relatives and the volunteers at which we discussed the work in the unit, the treatment, and the types of illness. It was necessary to explain to these outside visitors, for instance that paranoid patients have delusions, for sometimes visitors hear tales of maltreatment by staff which are quite untrue.

BREAD AND CIRCUSES

At another meeting we discussed the gifts which were most suitable to bring. When you go to see a sick person it is natural to bring food, and the giving, receiving, and eating together of the food is a primitive social custom. One of the many problems of old people is to keep them active, and this is difficult amongst the stout. Curiously their appetite never seems to diminish, and the visitor's presents of food are more welcome to the patient than the doctor. Small personal possessions are much more suitable. The patients appreciate articles of clothing. Even when they are quite lost, they are still vain, and the pleasure of the old men in getting ties, and the ladies in getting a pretty apron improves the atmosphere. The chief male nurse and the matron drew up a list of the sort of articles they felt the patients would appreciate, and these were bought by the association.

Our old people were away from the main entertainment hall of the hospital, and their only entertainment was shows by a visiting cinema projector. We got the hospital to make a stage, and several volunteer companies provided shows. At the first meeting of the association a member gave us £50 for a projection television set for the old people's ward. The old people cannot cluster round a small set. Many are in armchairs and their vision is poor. Of course, the set costs more than £50,

* Based on an address to the National League of Hospital Friends, Nov. 19, 1955.

MR. RAINS AND OTHERS: REFERENCES—*continued*

Gross, R. E., Bill, A. H. jun., Peirce, E. C. (1949) *Surg. Gynec. Obstet.* **88**, 689.
Hufnagel, C. A., Rabil, P. J., Reed, L. (1953) Surgical Forum. Philadelphia; vol. 4, p. 162.
Kinmouth, J. B., Taylor, G. W., Lee, R. H. (1955) *Brit. med. J.* **1**, 1406.
Lo Grippo, G. A., Overhulse, P. R., Szilagyi, D. E., Hartman, F. W. (1955) *Lab. Invest.* **4**, 217.
Moeys, E. J., Mreyen, F. W., Den Hartog, B. J. (1954) *Arch. Chir. Neerl.* **6**, suppl. 333.
Nuboer, J. F. (1954) *Ibid*, **6**, ii, 123.
Rob, C. G., Eastcott, H. H. G., Owen, K. (1956) *Brit. J. Surg.* **43**, 449.
Shumway, N. E., Gliedman, M. L., Lewis, F. J. (1955) *Surg. Gynec. Obstet.* **100**, 703.

but I asked for subscriptions, and within a month we had over £100.

One of the happiest parts of this work was that we attracted some local children's organisation to come in. A Scout troop adopted the unit, and came in and helped sing at the ward services on a Sunday and bring magazines and small gifts for the patients.

Most mental hospitals arrange summer outings, but the visitors' association arranged for the relatives to go with the patients. It is sometimes rather a grim business to see a coach-load of patients unloaded at the seaside with one or two staff shepherding them around and trying to collect them late in the evening. But when the relatives go with the patients on their outings it becomes a much happier party. We charged relatives half a crown or five shillings, according to where they were going, and we got bigger coaches! The whole thing was much more enjoyed, and the crocodile atmosphere disappeared.

Transport had held us up in many ways. Sometimes it was not convenient for a relative coming from a distance to call for another, and we felt that more relatives would visit if they could. The visitors' association offered to hire the local taxi for these people. Again an old patient who went on leave before discharge had to walk about a quarter of a mile to catch the bus and when he returned had to climb the hill to the hospital. For them, too, the association provided the local taxi.

We soon found out that many of the amenities that the relatives thought lacking were largely a matter for the hospital management committee, and we invited a member of the hospital management committee to come to our meetings. This link was surprisingly useful for it is not easy for a member of the H.M.C. to get to know the patients' individual needs. Their relatives, who know them so well, understand their real wants.

At one meeting a member asked for some curtains for the stage, and the H.M.C. member said "That is my job, you save your money. You have got plenty of things to spend your money on." And soon we had beautiful stage curtains. Another visitor said, "Well, I bring my mother some things, but as soon as she puts them down one of the patients who goes around hoarding things takes them, and they are lost. Could we have some little lockers for the better patients who would be able to look after their things?" The H.M.C. member said, "That is my job, that is not your job," and the things came along—once the patients' real needs were put forward by the visitors' association. Another suggestion which the relatives made was to improve the garden furniture. Visitors made a contribution and some furniture was ordered, and much of the old furniture was redecorated.

One of the many needs which the nurses pointed out was the lack of mirrors. In many hospitals these are strangely absent, particularly in dormitories and day-rooms. Women love to see themselves, and if they can see themselves often are more likely to keep clean and tidy. The hospital stores could offer only small shaving mirrors, so the visitors' association provided decorated mirrors in conspicuous places in all the wards.

CONCLUSION

The mental patient as well as the defective patient depends on his visitor to maintain his morale while he is in hospital, and to get him out of hospital when he is better. It does not matter how much a patient improves with treatment if his morale is not sustained; and if his visitors are not prepared to make the effort and to take him out afterwards, the work is largely wasted. It is important to interest the visitors in the treatment given to the patient so that they understand the hospital problems, and feel that it is a hospital and not a place where old folk are left to die with the aid of sedatives.

A visitors' association is needed not so much in the acute wards, where morale is good, as in the chronic wards, where the patients are most disturbed. There is a crying need in every mental hospital that I have ever seen to humanise the chronic wards, to make the nurses on the chronic wards feel that they are doing a worth-while job which is likely to get results, and to increase the public interest in this work.

I would like to thank the Rev. D. M. Lester, the hospital chaplain, and Mr. S. Palmer, Secretary of the Association, for their untiring work in making this project a success.

BLOOD AND RACE

THE following editorial appears in last Saturday's issue of the South African journal *Medical Proceedings*:

The decision of the Medical Council (after a secret debate at its September meeting) to recommend the promulgation of regulations requiring the racial identification of human blood intended for transfusion, will distress medical scientists not only in South Africa but also in the rest of the world.

In fairness to the Medical Council, it should be recognized that this lamentable excursion into the politics of the day was not initiated by a primary act within the Council itself. The draft regulations were referred to the Council as part of the procedure whereby the Minister of Health consults the Medical Council (as required by the Medical, Dental and Pharmacy Act) in matters touching regulations affecting blood donor services.

It is understandable that members of the Medical Council, men of moral and scientific conscience, found themselves in a dilemma when faced with the original draft regulations apparently prepared by officers of the Union Health Department, and regarded them as so repugnant that they sought a compromise whereby the draft regulations would be modified and submitted by the Council in their least offensive form. But this assault upon science cannot be condoned by lesser degrees of intellectual insult.

Until now, the only data required to identify blood for human transfusion was scientific information intended to ensure the greatest safety in the administration of that blood. By no conceivable stretch of the imagination can the racial identification of a bottle of blood help to make blood transfusion safer. (It should be recalled that the recent impetus to revise regulations governing the transfusion of blood and blood products was provided by 5 tragic deaths following the administration of contaminated blood to patients in Cape Town.)

The action of the Medical Council, because of its title and statutory status, can quite reasonably be interpreted by the public to mean that there is some kind of scientific basis for the racial labelling of human blood. There is, as is well known, not a tittle of evidence to support the view that there can be any conceivable danger (provided the blood is compatible and not diseased) in giving blood from one member of the human species to another member of that species, and it is regrettable that the Council's action may provide an opportunity for such a view to gain a footing amongst the ignorant and the prejudiced.

It is our submission that the Council misdirected itself and travelled outside its technical and expert sphere in agreeing to receive these regulations for consideration. In a sense, the regulations were foisted on the Council, but we feel that this august body should have regarded them, in the form in which they were submitted, as outside the ambit of the Medical Council's proper functions. In these circumstances, the Council would have been wiser to decline to handle the anti-scientific portions of the regulations, as their action in endorsing them could only lead to alarm and distress amongst all who set store by the principles of the scientific method which forms the very basis of the practice of medicine.

The further tragedy involved in the recommendation that these regulations be promulgated lies in the fact that they are totally unnecessary. As was stated at the public discussion of these draft regulations in Durban earlier this year, the Transfusion Services in this country do not transfuse blood from non-White donors to White recipients, in deference to

the known prejudices of most White South Africans in this matter. However, it is one thing for the donor services to observe such a social convention (provided those in vital need of blood are not prejudiced thereby) and quite another thing for the Medical Council to recommend that the racial identity of blood be inscribed by law on the container.

The *reductio ad absurdum* of this principle must also require racial identification of blood derivates, e.g., plasma, serum, fibrinogen, albumin, the globulins, etc. Indeed, the draft regulations presented by the Union Health Department make just such provision for the distinctive labelling of these products on a racial basis. Hitherto, most of these substances have been imported from overseas countries which do not exercise any racial discrimination in the selection of blood for these manufacturing purposes. Is the importation of these products now to be prohibited unless proof can be furnished that they have been labelled in accordance with our requirements ?

Blood is merely one of our most elegant and physiological graft tissues. Is it to be the fate of all other grafts used in South African surgery, that they must also be removed and stored separately and identified with a racially distinctive tag ?

The formulation of these regulations, if they are deemed necessary, should be the moral and legal responsibility of a body other than the Medical Council, as the principle involved is a political and ideological one and not one rooted in medical science. The Council should, therefore, not have allowed itself to be dragged into the hurly-burly of political polemics.

A Government may well sponsor and enforce blood transfusion regulations which flout the principles of science and the moral force of the Hippocratic code ; but such an action, purely political and anti-scientific in its quality, should not have embroiled a professional body such as the Medical Council. The provisions were conceived outside the walls of the Council and it is most unfortunate that they should ever have been considered within the walls of that Council.

The high reputation of South African medical science is in grave danger of mortal injury. The proposed regulations will undoubtedly provoke considerable opposition, even apart from those arguments that the principles of scientific thinking make imperative. We would therefore urge upon the Minister the need to refrain from proceeding with the promulgation of this ill-conceived and superfluous requirement which does not advance the cause, the safety or the practice of blood transfusion in the Union, and which can only expose the medical profession in this country to the scorn and ridicule of the civilized world.

The Wider World

"HONOUR THY FATHER AND THY MOTHER"

A Study of the Medicosocial Needs of Old People Living in Singapore

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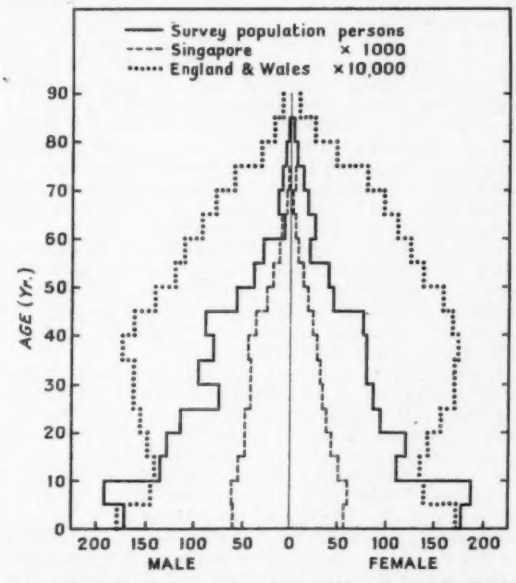
LITERALLY and metaphorically, Singapore is at the meeting of the ways. In 1819 the Sultan of Johore ceded and later sold to Raffles as a trading station a malarious swamp, a little smaller than the Isle of Wight, on which a handful of Malay fishermen and a few Chinese gambir planters lived precariously. Today, Singapore is a teeming city of 1·2 million inhabitants, having in places a population density of over 800 persons per acre. Driven by difficulties at home and attracted by the chance of good reward for hard work, in the peace of British administration and justice, Chinese have since Raffles's day come to Singapore. So have Indian merchants, who through the generations have stayed and prospered. Other Indians came, mainly from Madras, until stopped in recent years by the Indian government, and were attracted to contract labour. They remitted, by their standards, large sums of money to their wives and families whom they left in India and to whom they eventually returned. Malays, among whom power is hereditary, follow the Islamic way of life, and, forbidden to engage in usury, are less caught up in the rush of a get-rich-quick city. Pathetic memorials in St. Andrew's Cathedral show how few years separate the inhabitants of a modern city from early deaths due to killing fevers and violence. Indeed, the speed with which malaria and typhus returned in violent epidemic form when public-health measures were suspended by the Japanese gives unequivocal proof of how the Colony was, by British perseverance, claimed from the mosquito and sea. The successors of the pioneers who did this are today called expatriates.

In the 1920s the open-door policy allowed a large influx of young men escaping from banditry and poverty in China, and about ten years later they were joined by Chinese women who were to be their wives. Hokkiens, Cantonese, Kheks, Hainanese, and Teochews who are almost exclusively farmers, small traders, hawkers, and adventurers brought the restlessness of south China, in contrast to the semi-feudal and more cultured life of China's northern provinces. Unlike the Straits-born Chinese, who in part have adopted Malay dress and language, the new immigrants have not only swamped Singapore but also some of the towns of Malaya. No-one works harder than the Chinese, and their industry has brought great wealth to many and great benefits to the country. Coolies, with but a few cents in their belts, can, and do, by hard work, become wealthy in a life-time. That many of the Chinese feel drawn to China—and thereby some are sympathetic to Communism—cannot be seriously disputed. The cultural ring is tight. Confusion is worse confounded as five major Chinese dialects, of geographically determined origin, are not mutually intelligible.

One half of the population are under 21 years of age (see figure). Over 150 children are born a day. At the present time, school places are available for less than half the children. An average of one school (400 places) needs to be built and staffed every week. In 1947 the



The age-distribution of survey population. Also, the age-distribution of Chinese living in Singapore (1947) and the population of England and Wales (1947 estimated).

crude birth-rate for Chinese and Malaysians was 46·2 and 47·7 respectively and the corresponding net reproduction ratios 2·6 and 1·7. In 1954, the crude birth-rate was 48·8 and the infant-mortality rate 56·1. No other city has such problems, and even in Hong-Kong, which has nearly trebled its population in twenty years, cultural and racial stresses are absent.

Obedience to the Fifth Commandment has been the safeguard in old age. In the East the only practicable form of insurance for old age has been to beget a large family and to instil filial piety into your children. The sons are taught to care for their own parents, while the daughters learn that they will one day serve their future mothers-in-law. For many of the Chinese, filial duty extends still further, as it is essential to have a son to carry on the family name and perform the rites of ancestor worship. So important is it for a woman to have a child that a childless wife may expect and may even encourage her husband to take a second wife, or alternatively to adopt a child, preferably the son of a relation or of a family with the same surname (Cheng 1952). Although marriage arranged by matchmakers and in accordance with horoscopes still decides the fate of many, youths are more and more demanding the right to choose their own partners in marriage and in many cases to set up homes of their own. The Japanese occupation from 1942 to 1945, like the first world war in Europe, has disrupted the established order. As in Europe, generations are in conflict and traditional ways of life are being rejected by the young. Filial piety is weak against the fanaticism of youth. Encouraged by professional agitators, boys and girls are daily openly defying their parents in school strikes and emigrating to China.

Before the traditional ancestral and familial way of life has disappeared, we decided to undertake a survey of a small area of Singapore to inquire how old people fared. Old age was defined as 55 years and upwards. With the help of seventeen senior medical students, we interviewed 401 families (living in 238 houses) among whom were living 61 old men (oldest 84 years) and 78 old women (oldest 94 years). They were predominantly Chinese, reflecting the ethnic composition of Singapore. 20 old men and 27 old women were medically examined. 8 men and 9 women were too old to move for examination. Only 1 man (age 55 years, hemiplegia) and 1 woman (age 94 years, fractured neck of femur) were bedridden. Of those medically examined, half the men and two-thirds of the women were hypertensive (defining this as a blood-pressure of 150/90 mm. Hg and over). Bilateral cataract was present in 4 men and 6 women, and unilateral cataract in 1 man and 1 woman. 3 women were blind for other reasons. 3 men suffered from tuberculous cavitation of the lungs and 1 woman from renal tuberculosis. No complaints of painful feet were recorded.

In an attempt to assess why family care had broken down we visited institutions caring for the aged (139 men and 76 women were interviewed), the vagrants section of the prison (60 men and 4 women), temples, and mosques. Detailed results are published elsewhere (Lloyd Davies and Mills 1956).

Most of the old persons living with their families gave every appearance of a happy and active life. Certainly the extent of disease as disclosed by a quick medical examination would not be suspected. The incidence of hypertension, cataract, glycosuria, and tuberculosis is high. Even when every allowance is made for the influx of young Chinese twenty years ago, many have not attained old age. The customary retiring age of 55 years for those in pensionable employment seems to be justified. At this age, an average Chinese workman is equivalent of a man at least 10 years older in the United Kingdom. Two reasons occur to us to account for this. First, the paucity of medical services in years gone by and the consequent reluctance or inability to obtain advice about ailments in their earliest stage. Admittedly, before the Japanese occupation Western medicine was regarded with suspicion, and it only became much clamoured for during the occupation. Secondly, the great stress to which the Chinese subject themselves. They work hard for very long hours, seldom having a day's rest; and this, combined with parasites, drinking *samsu* (rice spirit), and a minimal diet (especially in China and during the Japanese occupation), may lead to fibrotic conditions on the analogy of kwashiorkor. (Over 85% of children in rural Singapore are infested with hookworms, and one-third of surgical patients admitted to hospital are similarly infested.)

No score can be put to happiness, but old people were happier when living with their families and if they had a function within the family. Small children to mind are a pleasure, but school-children playing are a nuisance. Women, having been used to being supported as housewives, adjusted more easily to handing over, first the washing, secondly the marketing, and lastly the minding of grandchildren to their daughter-in-law. All but the very infirm were able to keep themselves busy with trivial domestic jobs which gave a sense of being useful. The men presented a different picture: those who continued at work were only unhappy or anxious if without sons to continue their business; active men with pensions who followed hobbies or undertook voluntary work (committees of school and Chinese associations, &c.) were happy. Those not able to support themselves were sharply divided; some resented having to hand over economic provision to their sons, some regarded this as the natural outcome of old age. The relationship between father and son seems more potent of conflict than that between mother and daughter-in-law. The rising cost of living was a general complaint. Almost without exception, however, old people thought the rising generation had a "better time" than they had in their youth.

One old man, aged 62, whom we met in a pilot survey was probably happiest of all. Receiving considerable support from his son who lived near by, he kept a not very profitable small shop which was, in fact, his club where he gossiped with his friends and customers.

Sons frequently took wives to their parents' house. Where spouses had died, the survivor continued to live with a son or sons—this is a strongly defined pattern in the East in sharp contradiction to the West.

One woman, aged 68, lived in the same house as three married sons (ages 44, 38, 34 years) and ate at the rice-bowl of each son's family in turn. All the daughters-in-law took turns in washing her clothes.

The sense of filial piety—i.e., the duty to respect and care for parents—is strong.

In one family the sense of filial piety was sufficiently strong for a man aged 58, when he married a widow aged 49, to feel bound to support her former husband's father aged 72.

Filial piety is based on duty. In the case of the father it is based predominantly on duty, though it may be supported by affection. Toward the mother affection plays a larger part. In a few examples only, the wives' parents lived with their daughter and son-in-law. Often the husband so much resented his wife's parents that the wife had to visit her parents daily to look after them, and sometimes the husbands did not even allow them to do this. The strong tendency was for parents to be cared for by their daughters-in-law rather than by their daughters. Wives are absorbed into their husbands' families, and the husband's mother's domination of her daughter-in-law is not infrequently complete.

In one home a wife, aged 34, was expected to inform her husband's aunt (aged 78) every time she left the house or returned, even though the aunt's memory was fading and she took no part in the running of the home.

Another woman, aged 66, told us that her greatest wish was for one of her sons to marry, so that she would have a daughter-in-law to help her with the housework. Her own daughter had just married and was expected to devote her entire time to the service of her mother-in-law.

No overt mental illnesses were seen and old persons living in their own house with one exception appeared to be mentally stable—unlike the vagrants, among whom many eccentric characters were found. The family system seems able to absorb a mild degree of senile degeneration. From conversations with younger generations, we are sure, however, that this is not without considerable strain on the tolerance of children and grandchildren.

The material burden of old persons is small. This is because of the climate, which all year is at a near perfect temperature, eliminating the need for fires and thick clothes. Neither is there need to stay in bed to keep warm, and the risk of becoming bedridden is so much the less. Also, the dietary habits are simple: rice, fish, papaya, and groundnuts provide an adequate and soft diet. The lack of good teeth is not a problem.

A common matter of conversation among European and Chinese wives is concubinage and secondary wives. Chinese wives openly envy European wives because of the unhappiness they are saved. The justifiable fear of oppressive mothers-in-law or of the duplicity of husbands, and the need to insure against old age, are reasons why unmarried and married women join the sisterhood of Chinese semi-religious homes of retreat. "Men are bad . . . one can buy a child and have everything that marriage can offer and one's own money too . . . if I get married and my husband becomes rich he takes a concubine, if he becomes poor, I have to go out to work . . . if I got married, how would I know the man would not have a wife already in China, that happened to a friend of mine" (Topley 1954).

The Chinese are a practical but superstitious race. Death seems to be accepted even though mention of the word is thought to bring bad luck. The main anxiety is to be buried "properly" and to be an ancestor. Only by being worshipped can the soul be anchored to an earthly place. If the soul, which is sent onwards accompanied by paper models (including money) of all that may be needed, is not fixed, it becomes a devil and wanders over the world. To old people without children death in a government institution is attractive, because the government will "bury you properly"; and for the same reason burial clubs are popular. In a Chinese temple (Buddhist) served by eight women (including three old women) who lived in an attached house, one of the women said on the death of the oldest inmate "we will put her soul at the back of the temple" (the temple did not itself accept souls and the desired effect would be achieved by erecting a tablet before which prayers will be offered). Another inmate whose son was in China did not pray for her deceased husband, who died in China, as "his soul is in China and my son prays for it." The fear of becoming a hungry wandering ghost is very intense. The lack of someone to pray for you is a minor but not negligible reason for conversion to Christianity, for the need is then eliminated. Except in a Roman Catholic home, old persons did not seem to be unduly attentive to religion.

Welfare allowances are regarded as a form of benevolence; many old people are not aware of them, and, of those who are, some dislike the consequent inquiries. For a single person the social-welfare allowance is 15–30 Straits dollars (£1 15*s.* to £3 10*s.*) a month depending on circumstance. These allowances are barely adequate. Without some support from family or friends the old person unable to work must either enter an institution or beg.

Old people's attitudes varied considerably with the institution in which they resided. The institution Y, situated in the centre of Singapore, was largely populated by Europeans or Eurasians. They held that they had fallen below their proper station in life and spent much of their time either annoying their fellow inhabitants or writing letters of complaint to the superintendent. The Europeans formed an unhappy group left behind after the war. Even before the war, many had been beachcombers, and they now regretted the equality of the prisoner-of-war camps. In institution Z, whilst everything was done for the old persons' physical welfare, little or nothing was done to engage their interests. Old people spent the whole day "just sitting." Any suggestion that they might benefit from medical help (e.g., spectacles) was resisted. In the Roman Catholic Home (open to all religions) the emphasis was strongly towards spiritual welfare, and all were "taught to pray" and expected to attend prayers regularly. Old persons were happy, alert, and received kindly care, but were eager to obtain physical treatment for the ailments from which they suffered. Indeed, much of the time of the investigators was taken up by arranging for the admission of old people to hospital for urgent operations or the treatment of gross anæmia, pulmonary tuberculosis, and similar conditions.

The most cheerfully discontented group of all were the vagrants in prison. This seems to us to be for two reasons. First, to have got into prison the old men had exercised initiative: at least, they were arrested in an attempt to earn their living by begging or had exercised their wits. And, secondly, even those ill persons judged not fit for full work were given light tasks to perform, and the mild discipline to which they were expected to respond kept them alert. If it were not for the compulsory confinement (old people in homes can make daily visits outside more or less at will) we would unhesitatingly choose prison, rather than the other institutions, as our home in old age.* A little eccentricity in old age prevents much personal boredom. In an overwhelming majority the vagrants were without families; their spouses had died or had been left in China, or they had never married. The death or murder of children during the Japanese occupation was the cause, in just over one-third of the inmates, of loss of family, and just under a third had left their wives in China and never been joined by them. Often such wives are referred to as "dead." As might be expected the proportion of Straits-born persons in homes or prison was small. 40% of old men in prison admitted addiction to opium, and this is an important cause of their vagrancy; but whether smoking opium is the primary or secondary reason for poverty could not be assessed. Opium addiction and gambling were often given as reasons for not marrying. On the whole we believe opium-smoking is an escape mechanism. To condemn opium out of hand is to exhibit a rigid lack of compassion. Any misfortune to their immediate family left immigrants without more distant relations on whom to call for help. Literacy may have an additional protective value, though this may be because education in English was, in their youth, available easily only to the Straits-born.

Before the Japanese occupation those sleeping at night on the five-foot way (a local name for pavement) were in danger of being arrested. Mosque and temple committees allowed their precincts to be used by those who had nowhere else to sleep. Today poor people can sleep unmolested outside their friends' houses, or rent a piece of the five-foot way; so only caretakers, many of whom are infirm or old, are now found in the mosques and temples at night. At certain periods of the year, depending on the religion and nature of their customs, in several

* Fry (1955) comments on the privacy of prison cells; this desire was not found in our survey.

of the mosques and Hindu temples food is given to young, old, rich, or poor who come to worship or to watch. Most but not all of those participating are poor and many are old. In this way a few eke out a miserable existence.

Unlike the citizens of a modern industrialised culture, men and women in Singapore are prematurely old at the age of 55. The causes lie in their childhood, deficient diets, parasitism, and excessive labour. To what extent medical and social provisions, now being expanded rapidly, can prevent premature ageing is a matter of speculation. In a city half of whose population is under 21 years of age the care of the old presents difficulties. Machine power has not yet replaced muscle power, except in a few modern factories, and the chance of alternative employment for men prematurely aged is very small. The contractor system of labour, whereby men and women are hired out for their muscle power, means that all must work to their full capacity. If old men and women are not able to do this the alternative is to stop working. The old cannot, as in the rural society of England or China, be "carried" by the young. Though the abuse of the machine has brought disaster to many societies, it does at least relieve men of excessive muscular effort.

Happiness of the family, like the happiness of any human community, depends on interpersonal relationships. Filial piety does not of itself establish a happy relationship. This is the crux of the difficulties facing the Chinese culture; how long, in the face of Western influence, can personal unhappiness support duties which in the West have been transferred to the State? Clearly there is an optimum balance (which in the West may well have been exceeded).

REFERENCES

Cheng, H. (1952) *Ann. China Soc. Singapore*, p. 46.
Fry, M. (1955) Old Age in the Modern World (Report of Third Congress of International Association of Gerontology, 1954). Edinburgh; p. 8.
Lloyd Davies, T. A., Mills, R. (1956) *Med. J. Malaya*, **11**, 1.
Malaya and Singapore (1947) Census of Population. London (Crown Agents).
Registrar-General, 1954. Statistical Review of England and Wales, 1946–50. H.M. Stationery Office.
Topley, M. (1954) *J. Malay. Br. R. Asiat. Soc.* **27**, 51.

Public Health

"Nottingham Meningitis"

REFERENCES have appeared lately in the lay press to "Nottingham meningitis" (more commonly known there as "Trent Valley fever"). Early in 1955 there appeared during a mumps epidemic a group of four or five cases of pyrexia with meningeal signs, which showed some of the features of mumps encephalitis. No positive result, however, was found on specific tests for mumps, and the precise nature of the disorder was not identified even after extensive serological investigation. Since then occasional similar cases have appeared, and in the past two or three months these seem to have been increasing.

The onset is variable; but usually pyrexia, headache, and photophobia increase over the first day or two. There may be no further symptom or there may be onset of various transient nervous features (vertigo with nystagmus has been not uncommon). Vomiting and mental symptoms have been rare. There is no rash or lymphadenopathy. There is no great prostration and consciousness is not impaired. The symptoms usually subside about the sixth day of the illness, and all patients have recovered. Two or three members of a household have been affected, but no link has been found with poliomyelitis. Patients have been of all ages up to 50. The cerebrospinal fluid is not under increased pressure; there may be some increase in cells—up to 20 or so lymphocytes per ml. No other abnormality has been found.

Investigations so far have failed to reveal the nature of this seemingly benign illness.

In England Now

A Running Commentary by Peripatetic Correspondents

THE proposal for the setting up of a Queen Square Users' Association is perhaps the most welcome sequel of the recent political upheaval, and one on which all the aggrieved parties are in unanimous agreement. Experience has amply confirmed the disastrous results which may be expected if the administration of this precious strip of land were to depend on the whims and fancies of a single autocracy. To allow this intolerable situation to continue unchecked is to court almost inevitable economic loss and decline of prestige. For this reason, the issues in the present dispute are more far-reaching than they may appear at first sight, and vested in the birth of the Users' Association is the most cogent bid towards peace and security which has as yet been made. The purpose of the Association is clear—the effectuation of unimpeded transit through the square at all cost. To prove itself a practical proposition, many difficulties will have to be faced. Firstly, the payment of dues requires urgent attention. The existing exploitation of profits to further interests not even remotely connected with the upkeep of Queen Square constitutes a deliberate misuse of this vital link between East and West. The proposal that henceforth all dues are to be paid direct to the Association, which will then apportion a reasonable fraction to the administrators for their services, is to be heartily endorsed. The vexed question of discrimination towards certain users will also require careful investigation, and evidence is not likely to be slow in forthcoming. Even more serious, however, are the disturbing reports of unilateral aggression, which in themselves call for the most resolute countermeasures. Praiseworthy as the aims of the Users' Association may be, the degree of coöperation it may expect from those at present in control is, to say the least, unpromising. The fate of the first official Users' Association candidate to present himself at Queen Square remains to be seen, but the likely response is not difficult to imagine. The direction in which the next line of attack lies is a matter for conjecture. It may well be that, given United States aid, a boycott of the square is not as impracticable as it may seem. As a last resort, the dispute could be referred to the United Nations.

* * *

At the end of the consultation the charming American asked, "and now, Doctor, what do you personally think of your health service." "Well," I replied guardedly, not wishing to paint the service in glowing terms, nor risk being unpatriotic by seizing on my pet grumbles, "Well it is, of course, wonderful in theory and even now we are knocking its practice into shape. The pity of it is that the profession was divided, lost its nerve, and with it the opportunity of having more say in arranging the technicalities of the service. Otherwise we might have avoided the two extremes of general practice whereby the doctor has either a long list of patients, not much time for medicine, and a large bank balance. Or a short list, plenty of time to practise the best medicine he can but gets little reward compared with his big-list colleague."

"Of course, you know," the American went on, "in my country the doctors are cutting their own throats, and they'll have socialised medicine if they're not careful. Why, do you know our new hometown doctor is just out of college but when he comes round to give Mom her shot for incipient avitaminosis he charges $x. I think it is nothing short of scandalous! Why I believe that right here, the way fees are adjusted, one would think that all you doctors are descended from Robin Hood; but back home one can hardly afford to have the doctor, let alone a baby."

"But of course, dear," her husband interjected, "you must remember that we have our insurance schemes, and that in industry we consider it our responsibility to look after the health not only of our employees but their families as well, for if a man's wife or child is sick, either that man stays at home or his efficiency is handicapped by the worry."

I was preparing to go, while thanking them for their interesting conversation and thinking that if only British industry would or could enter into the field of social service—when she said "Oh, by the way, Doctor, how much do I owe you?" Well, I could have shut those throat-cutting colleagues out of my mind, but why the devil did she have to mention Robin Hood?

* * *

He was a typical example of the salty, battered, old man who has spent his life looking at broad horizons, and it was sad to see him reduced by myocardial failure to the immobility of a hospital bed. Nothing that we tried seemed to do him any good. "And nothing will," he said, "unless some of that spermatic rock that they gave me once in the Leeward Islands." I consulted all the reference books but was none the wiser. I asked him again about the mysterious rock: where did it come from? "Out of the Sargasso Sea," he replied. I decided on a bold stroke. "We'll write off for some," I said.

It was one of those hospitals where the residents did their own dispensing. I took something from every shelf and made up a nice 12 oz. bottle. No incompatibilities emerged, and the mixture was a rich pink colour with a white froth on it. It tasted—not that I have ever tried such a thing—like Dubonnet and fizzy lemonade with a dash of crème-de-menthe.

"Here we are," I said to our old friend, "all the way from Devonport: genuine solution of spermatic rock: three times a day." He was enchanted: and thence-forward his mobility increased daily.

Alas, this is a moral tale. The patient finished the bottle—and I had not noted its ingredients. The next bottle was only a pale shadow of the first. The old man noticed the difference and, do what we liked with him, we could not produce any further improvement. The heart has its reasons . . .

* * *

Getting out of the bath the other night, I suddenly became aware of my body: on the whole it was rather skinny, with a narrow chest turning to corpulence round the midriff. "How ugly" was my first thought. But after a moment's reflection I came to the conclusion that perhaps it was not so bad after all. It fitted very well the life I lead.

I looked back to my youth. Never had a serious illness or an operation. Though always a bit of a weed, I had managed to do rather better than average at sports and games and even managed to win a few long-distance races.

I looked back to the war. Several years cooped up in a small landing-craft in the Far East had left my health untouched. I had returned home well, though very thin, while my two six-footer colleagues came back one with malaria and the other with a damaged lung.

Now my life is sedentary, and I regard my body as a carrier for my mind, taking it to and from work or pleasure each day: this my body does to perfection, without trouble or pain, not feeling too hot in summer nor too cold in winter. Gardening at weekends, Scottish dancing once a week, and running for the bus each day give it just enough activity to keep it nicely fit.

Yes, I'm quite satisfied with my body; and, do you know, I'm rather attached to it as well.

* * *

A grandniece, aged 6, was lately brought to me for advice about an early degree of genu valgum; among other things I suggested that her father should buy her a pony, on the principle that one never sees a knock-kneed jockey. This advice was evidently greatly appreciated, and from Guernsey, where she is on holiday, I have received this postcard, surrounded by x's:

"I can swim two stroked without a rubber tyre, And I go out of my depth with with my rubber tyre And if it doesn't poer we will go to sark. it is my oen spelling. Mumy says rok climing will strenthen my legs, and Daddy says that crocy is good for my legs because I loock as if I am riding three harses at once."

A later card finishes:

"I lick POUILLY FUISSE. Love from Philippa."

Letters to the Editor

ADVERTISEMENTS FOR DRUGS

SIR,—The busy practitioner nowadays places some trust in the information supplied by pharmaceutical firms, who clearly regard themselves as competent to dispense therapeutic advice as well as drugs. The drug industry thus has a responsibility not to mislead the practitioner, whom they must know to be too busy to study the original literature on every single problem which confronts him.

We have recently been alarmed by certain advertisements which have presumably been widely circulated amongst the profession. One of these concerns triiodothyronine, the indiscriminate use of which has already been the subject of unfavourable comment.[1]

One of us wrote to the distributors of 'Cynomel' (triiodothyronine) protesting against the encouragement that their circular gave to the use of a thyroid derivative for the symptomatic relief of "physical sluggishness," "mental sluggishness and decreased emotional control," and a variety of other symptoms which they describe as "metabolic insufficiency." Time will show whether this syndrome is a real clinical entity, but at present this combination of symptoms would lead most doctors to suspect an anxiety state. It is known that the effect of thyroid extracts on normal people is to suppress their own thyroid function, and teachers of medicine have for a long time been convinced that thyroid treatment is indicated only in cases of proven thyroid deficiency. This view is not challenged by the recognition that there may be rare patients with low basal metabolic rates who fail to respond to thyroxine but respond to triiodothyronine. In reply to the protest the director of the firm stated that he believed that there was adequate evidence "to warrant the introduction of a product which we realise may compel a revision of medical concepts in the field of impaired metabolism." A subsequent letter, however, suggests that the circular and advertisements are to be revised.

Another firm has introduced three preparations—'Vi-Magna' capsules, 'Lederplex,' and 'Gevral'—all of which contain, amongst other things, both vitamin B_{12} and folic acid. Their pamphlets recommend these drugs for the oral treatment of "those 'generalised' conditions so familiar to every practitioner," including "ill-defined states of enervation, poor appetite and 'general debility.'" Also, "post-prandial distension, 'neurasthenia,' skin dysaesthesias, lassitude and calf muscle tenderness," and for general use in the elderly, in whom 'Gevral' "has been aptly said to 'add years to life and life to years.'"

Quite apart from the fact that these are just the patients who apparently should receive 'Cynomel,' patients with undiagnosed anæmia are likely to receive these preparations. The indiscriminate use of vitamin B_{12} and folic acid has been condemned on both sides of the Atlantic. Not only does it lead to diagnostic confusion in the anæmias, but patients with pernicious anæmia, unable as they are to absorb vitamin B_{12}, will respond to folic acid which is known to precipitate subacute combined degeneration of the spinal cord, and so may develop permanent disability.

In reply to a protest to this firm we received a letter agreeing that this combination of drugs was unsuitable for pernicious anæmia and stating that it would be "reasonable that such conditions should be excluded before initiating treatment." This of course agrees with the generally accepted teaching, that no patient with anæmia should be treated until fully investigated. To screen all patients with these vague symptoms is however clearly impossible, and it would surely be better to

1. *Brit. med. J.* Sept. 22, 1956, p. 702.

remove a potentially dangerous drug from otherwise innocuous preparations.

We consider that such advertising as we have mentioned here is both dangerous and unethical and likely to impair the medical profession's confidence in the pharmaceutical industry.

It would be interesting to hear the views of physicians on these particular topics and also on the wider one of whether "ethical" commercial interests have any obligation to heed medical opinion.

Medical Unit,
University College Hospital
Medical School, London,
W.C.1.

D. R. LAURENCE
T. A. J. PRANKERD
M. L. ROSENHEIM.

ANARTHRITIC RHEUMATOID DISEASE

SIR,—I was greatly interested in the article by Dr. Bagratuni (Oct. 6); for the group of cases he describes falls into line with, and amplifies, those he quotes from my communication in 1951 entitled "A myalgic syndrome of the aged with systemic reaction."

I then recorded 13 cases, of average age 71, with pains in the muscles, loss of weight, fever, markedly raised sedimentation-rate, and often some anæmia. There were no radiological changes. In 3, some six or more months after the onset, a few joints became involved. Points made were the late age and the frequency and prominence of antecedent physical stress. The essential treatment was rest, often much assisted by a short course of corticotrophin. The condition was considered to be a rheumatoid syndrome of the aged.

Since 1951 many more cases falling into this group have been seen, and some have progressed to complete remission—witness one who at 70 is again mountaineering. But some, even after corticotrophin therapy, tend to relapse and may require more prolonged steroid treatment.

The importance of this not uncommon syndrome is the difficulty of diagnosis from occult carcinomatosis and multiple myelomatosis and the reasonably good prognosis if treatment is adequate. It is almost impossible, however, in the early stages to differentiate between this condition and the prodromal phase of the much rarer cranial arteritis.

I feel that this myalgic condition should be recognised as a rheumatoid syndrome of equal importance to the now accepted episodic and oligarticular types of this variable disease.

Bath. G. D. KERSLEY.

SIR,—The article by Dr. Bagratuni on this interesting syndrome prompts me to report a similar case in whom the outcome was fully developed rheumatoid arthritis.

I first saw the patient, a woman aged 68, in February, 1953, when she complained of muscular pains in cervical and lumbar regions. There seemed no reason to doubt a diagnosis of fibrositis, but, as she did not improve, further investigations were instituted which revealed the following: (1) a hypochromic anæmia with Hb varying between 53% and 71% (100% = 14·5 g. per 100 ml.); (2) an increased erythrocyte-sedimentation rate (E.S.R.) of 40–50 mm. in the first hour (Wintrobe); (3) hypoproteinæmia, usually in the region of 5·5 g. per 100 ml., with a normal albumin-globulin ratio; (4) normal serum-cholesterol and blood-urea. X rays revealed no evidence of bony or articular disease.

As I was at that time interested in the sodium-chloride levels in fibrositis, her serum-electrolytes were estimated on several occasions, showing lowered sodium and chloride levels and a raised potassium level. As an example, in November, 1953, these were as follows:

Sodium	135 m.eq. per litre	(310 mg. per 100 ml.)
Potassium	5·7 " " "	(22 mg. per 100 ml.)
Chlorides	88 " " "	(515 mg. per 100 ml.)
Alkali reserve	20·4 " " "	(45 vols CO_2)

Addison's disease was excluded by negative Kepler and Cutler-Power-Wilder tests, and the 17-ketosteroid excretion was normal at 4·7 mg. per twenty-four hours. Intravenous pyelography and urine examination showed no abnormalities. The patient was given salt and phenylbutazone by mouth and iron by injection. The serum-chloride level rose to 573 mg. per 100 ml., the E.S.R. fell to 19 mm. in the first hour, the plasma-proteins and hæmoglobin remained unchanged, and there was some symptomatic improvement. She continued with this régime until August, 1954, when she exhibited unmistakable signs of myxœdema. Treatment with L-thyroxine resulted in rapid regression of these signs and improvement in her general well-being. The muscular pains and anæmia, however, remained unchanged. In March, 1955, she exhibited obvious rheumatoid changes in the small joints of both hands. These rapidly progressed and were confirmed by X rays. A course of cobalt chloride had no effect on the anæmia. In November, 1955, her Hb was 57% and cortisone therapy was instituted for the first time. Treatment with L-thyroxine had been continued all along, attempts to omit it resulting in recurrence of hypothyroidism. There was a rapid symptomatic improvement with cortisone, and the Hb rose to 75%, where it has been maintained until the present date.

This case illustrates the difficulties in the management of chronic "fibrositis," when underlying organic disease may not become apparent for some considerable while. It is probably wise to watch such cases with considerable care so that underlying causes may be detected early.

Twickenham, Middlesex. DAVID WHEATLEY.

WAR SURGERY

SIR,—The article on Commonwealth Surgery in the Korean war, by Colonel Wright (Sept. 8), appearing a decade from the end of the 1939–45 war, invites comment from those who treated wounds in the campaigns of that war.

In the war of 1939–45 we learned that fluid should be given only intravenously to a badly wounded man in the regimental aid-post, field ambulance, or preoperation tent of an advanced surgical unit. To give quantities of hot sweet tea to a patient going to have a general anæsthetic within an hour or so was found to be thoroughly bad practice. It should be unnecessary to stress this point nowadays, but the "hot sweet tea" idea dies very hard among lay first-aid workers, and Colonel Wright does well to repeat the reasons against this practice.

It is interesting and surprising to note the difference between the U.S. Army medical authorities' and the British surgeons' approach to amputations. "Generally speaking" Colonel Wright remarks, "British surgeons expect the first amputation to be at the definitive level whereas the Americans accept the need for re-amputation at a higher level in a large proportion of the cases as inevitable." The U.S. Army medical authorities have laid down, apparently, that all major amputations must be done by the modified guillotine method. I am sure that in 1939–45 the majority of British surgeons followed the practice advocated by Colonel Wright. Even at Anzio we did not find any necessity to perform guillotine amputations, and skin flaps were always made, sometimes with one or two retaining stitches over a gauze pack between the flaps, as E. A. Jack had recommended.

Colonel Wright's descriptions of the debridement of wounds at the primary surgical treatment; the aspiration of a traumatic hæmothorax to empty it, and repeated aspiration if required to keep it empty; and the use of the Tobruk plaster in preference to padded spica casts in serious fractures of the lower limb, make acceptable and familiar reading to the forward surgeon of 1939–45.

Somewhat unfamiliar, and obvious improvements on the conditions in 1939–45, are, firstly, the use of armoured vests which has accounted for the low proportion of penetrating chest wounds and the increase in the proportion of survivors in Korea, and, secondly, the employment of helicopters as an aid in the evacuation of battle casualties.

In surgical technique, the main progress in the Korean war has occurred undoubtedly in the repair of arteries. This section of Colonel Wright's review shows the great advances that have been made in vascular surgery since 1939–45; and just tribute is paid to the Americans in this field.

Colonel Wright has made a valuable contribution to the literature on war wounds. I am putting it on the shelf alongside Jolly's *Field Surgery in Total War*, the *Field Surgery Pocket-Book*, and the *British Journal of Surgery's* war surgery supplements.

Edinburgh. JAMES A. ROSS.

A FATAL CASE OF GLANDULAR FEVER

SIR,—I was interested in the report by Dr. Shinton and Dr. Hawkins (Oct. 6). I note that their list of fatal cases does not extend beyond 1950. In 1952 Dr. Keith Millingen and I reported a fatal case of glandular fever with some unusual features.[1] There are certain similarities between the two cases.

In both the patient was a young man with typical serological and hæmatological findings (both having a slight leucopenia), and a raised blood-urea level. In our case, however, the hepatic element was more in evidence, with definite jaundice. The liver showed perilobular fibrosis and cellular infiltration of the portal areas. The kidneys showed tubular degeneration with cloudy swelling, blood, and granular casts. All organs sectioned showed infiltration with mononuclear cells of glandular-fever type.

It appears that in the case of Shinton and Hawkins the lymph-nodes were more severely and extensively involved than in our case, where the main lesions were in the cœliac and hepatic hilar glands. The heart and lungs manifested little change, apart from the presence of bile-stained fluid in the associated sacs. In neither case is the high terminal blood-urea level quite explained by the histological findings, although apparently more renal damage was seen in our sections. How much of the "hepatitis" in this case was directly due to the disease, or secondary to obstruction by hilar gland enlargement, was rather debatable.

London, W.1. STANLEY F. MARSHALL.

TETANUS

SIR,—The management of a case of tetanus is such an exacting responsibility, the outcome of the individual case so doubtful, and personal experience of this relatively rare disease necessarily so limited, that one welcomes the publication of detailed case-reports. Reading recent accounts one wonders if the complexities of some modern treatment routines really constitute an advance.

Our latest case of tetanus demanded two breakfasts yesterday morning (Oct. 11); he ate both without help and without masseter spasm. He is a 3-year-old boy; his incubation period is indeterminate, for he had no culpable wound. Difficulty with feeding because of lock-jaw was first experienced on Sept. 19. Before transfer by ambulance to this hospital on Sept. 20 he was given rectal tribromethanol ('Avertin') at the anæsthetic dose of 100 mg. per kg. estimated body-weight, and from that time till Oct. 8 he was under continuous tribromethanol anæsthesia: this formed the basic treatment. A quiet room, meticulous attention to details of nursing (particularly directed to avoiding any unnecessary stimulation), aspiration of pharyngeal secretions, the bed raised at the foot, nightly gastric-drip feeds, and prophylactic penicillin were important adjuvants to the basic treatment. An elective tracheotomy would have been undertaken had difficulty been experienced with his air-way: the emergency tracheotomy set was kept at the bedside.

An indwelling catheter in the rectum allowed tribromethanol to be given with minimum disturbance; the level of anæsthesia varied from so deep that moderately painful stimuli were tolerated to so light that reflex swallowing and slight muscle spasm were observed: on three occasions he became so "light" that severe spasms and cyanosis occurred. At the height of his illness 1·0 g. of tribromethanol was needed two-hourly to maintain a satisfactory depth of anæsthesia (not all was retained), and a total of 109·3 g. was given in twenty days before he could be allowed to "come round," to be "tapered off" with chloral hydrate by mouth.

Desperate diseases require desperate remedies; but parenteral fluid therapy, muscle relaxants, intravenous and inhalation anæsthesia, positive-pressure respiration, and even tracheotomy, have such theoretical and practical disadvantages in the management of tetanus that the simplicity and effectiveness of tribromethanol deserve to be remembered. Yet only a year or two ago we had the greatest difficulty in securing sufficient tribromethanol to complete the treatment of another case, so little is this admirable substance now used in this country.

As Auld and Forbes point out,[1] the mortality of 21% in 47 cases achieved by Cooke [2] using tribromethanol has yet to be bettered in a comparably large series.

Ipswich. R. M. MAYON-WHITE.

1. Marshall, S., Millingen, K. S. *Brit. med. J.* 1952, i, 1325.

MYOPATHY IN SHEEP

SIR,—The paper last week by Dr. Bosanquet and her colleagues must surely have been of absorbing interest to all who are interested in human diseases of muscle. The pathological changes in the muscle-fibre which they describe and illustrate certainly bear a close resemblance to those seen in human cases of polymyositis. However, as they rightly point out, identical changes (patchy fibre necrosis and phagocytosis with signs of regeneration) are seen in a variety of other conditions, including rapidly progressive muscular dystrophy, virus infections, and severe myasthenia gravis as well as in a number of experimental conditions (vitamin-E deficiency, poisoning with plasmocid). It is apparent that the muscle-fibre can have only a limited repertoire of response to a variety of noxious influences. In passing, I should like to ask the authors whether their histological studies threw any light upon the cause of the muscular pseudohypertrophy which was sometimes visible macroscopically. Apparently it was not the result of infiltration with fat or fibrous tissue; were swollen muscle-fibres present in sufficient number to be responsible for this change, and did they contain more myofibrils than the normal?

Differential diagnosis between muscular dystrophy and polymyositis in the human depends upon a combination of clinical, electromyographic, and pathological findings and cannot always be made on pathological findings alone. Much evidence is available to suggest that in many cases of polymyositis the disease is related to others in the "collagen" group, though some cases presenting a similar syndrome may be due to undefined toxic or metabolic factors.[3] However, the fact that the condition in sheep appears to have a hereditary basis argues against "collagen" disease as a cause, while the comparative absence of perivascular cellular infiltrates is somewhat against an infective origin, though a virus ætiology is a possibility. On the evidence presented, a nutritional cause would seem at least as likely, particularly in view of the close resemblance of the clinical and pathological features to those seen in myopathic calves [4] and in other animals with vitamin-E deficiency.[5] It would, however, be of the greatest interest to know whether treatment with cortisone, neostigmine, vitamin E, or modern antibiotics has been proved ineffective in these animals. A further possibility would be to suggest that this is a hereditary disease, akin to human muscular dystrophy. Dr. Bosanquet and her colleagues draw an analogy between the myopathy they observed in sheep and the manifestations of facioscapulohumeral dystrophy described by Tyler and Stephens [6] in a large family. They cast doubts upon the validity of the term facioscapulohumeral as a description for cases in the latter series and also suggest that available evidence concerning the mode of inheritance of muscular dystrophy is inadequate; but in fact the

1. Auld, M., Forbes, G. B. *Amer. J. Med.* 1955, **18**, 947.
2. Cooke, J. V. *J. Pediat.* 1953, **43**, 220.
3. Walton, J. N. *Proc. R. Soc. Med.* 1956, **49**, 107.
4. Blaxter, K. L., Brown, F., Macdonald, A. M. *Brit. J. Nutr.* 1953, **7**, 287.
5. West, W. T., Mason, K. E. *Amer. J. phys. Med.* 1955, **35**, 223.
6. Tyler, F. H., Stephens, F. E. *Ann. intern. Med.* 1950, **32**, 640.

descriptions of Tyler and Stephens show that their cases were suffering from facioscapulohumeral dystrophy in typical form, while recent work has resulted in substantial agreement upon the mode of inheritance of the various forms of human muscular dystrophy.[7 8] Furthermore, facioscapulohumeral dystrophy is generally the most benign and chronic form of the disease, in which acute degenerative changes in the muscle-fibre are very uncommon; for practical purposes, changes approaching the severity of those illustrated in the myopathic sheep are seen only in rapidly progressive cases of muscular dystrophy, usually those of the Duchenne (pseudo-hypertrophic) type.

I do not wish to deny the fascinating possibility that the sheep myopathy may be akin to human muscular dystrophy, but clearly much more information is necessary before this hypothesis can be tested. Controlled breeding should be carried out to determine whether the disease is inherited and, if so, the pattern of inheritance. A hereditary myopathy in mice, in which the histological changes in the affected muscles are much more like those in human muscular dystrophy, has been described recently.[9] The availability of at least two types of experimental animal will undoubtedly open new avenues of research which may throw light on many outstanding problems in our understanding of diseases of muscle in man.

Royal Victoria Infirmary, Newcastle upon Tyne. JOHN N. WALTON.

TORSION OF THE TESTIS

SIR,—I was most interested to read about Mr. Scott's three atypical cases of torsion of the testes (Sept. 15). I am sure he is quite right in saying that many cases are missed because the clinician does not think of the possibility. A sign that I have found most useful is that the œdema of the scrotum is mainly anterior; but unfortunately by this time the testis is often gangrenous.

I was disappointed that Mr. Scott did not stress the importance of fixing the opposite testis. I have always made a practice of this as I am convinced the condition is due to a long congenital mesorchium, which is usually bilateral, with the result that the opposite side frequently undergoes torsion at a later date. I have never found any disadvantage in doing this at the same time as the original operation.

Hove, Sussex. S. HENRY C. CLARKE.

A RESIDENT'S COMPLAINT

SIR,—Before hospital management committees are inundated with requests from medical staff to be paid rebates on the sums deducted for their board and lodging whilst on holiday, I think that your readers should be told that the reply received by Dr. Barber (Oct. 6) from the Ministry to his inquiry is completely misleading.

First, in the case of house-officers, the terms and conditions of service of hospital medical staff published in June, 1949, provided for a deduction of £100 a year for emoluments. In regard to these officers, it is therefore wrong for the Ministry to say that it is for the employing authority to fix a charge equal to the value of the services provided.

Secondly, on the assumption that the Ministry's letter was written after Aug. 1, 1956, it is wrong in relation to all medical staff because an agreement was reached earlier this year on the deductions to be made for the board and lodging of all medical staff. Hospital authorities have not yet, however, been enlightened on what the terms of this agreement are except for the amounts of the charges; more than two months after its effective date the terms of the agreement have still not been published.

To my knowledge, the Ministry has always held the view in regard to house-officers that the charge for board and lodging was fixed at an amount which took account of absences on leave. The Nurses and Midwives Whitley Council has been sensible enough to regulate the position by agreement, but I think it is pertinent to point out that, whilst house-officers are charged £125 for board and lodging and other services provided, a sister pays £164 a year for these services and a staff nurse £153. A student nurse pays only £6 a year less for her emoluments than does a house-officer.

It is always difficult to persuade someone that a charge fixed for board and lodging has made allowance for absences on leave, and it is much more satisfactory to fix a higher yearly charge and make a rebate for absences because justice will then be seen to be done.

Dartford, Kent. R. MORGAN.

INTERACTION OF DEPOLARISING AND NON-DEPOLARISING RELAXANTS

SIR,—I was interested to read the letter last week by Dr. Hamer Hodges and Dr. Foldes.

For some time I have suggested to my colleagues that it is dangerous to administer both depolarising and non-depolarising relaxants to a patient during anæsthesia, for on several occasions during the past two years I have seen prolonged apnœa due to this cause.

I have suggested that, because the apnœa produced by the depolarising drug has worn off, it is wrong to assume that there is no residual effect on the end-plate, and that possibly some breakdown product is still circulating which may act with the non-depolarising relaxant and give a dual block which is perpetuated by neostigmine.

I entirely agree with Dr. Hamer Hodges and Dr. Foldes that curare-like drugs should never be administered after a succinylcholine drip, but I would go further: in my experience it is the small initial dose of succinylcholine used for intubation that may be the cause of prolonged apnœa when non-depolarising drugs are used later in the anæsthetic.

London, W.1. JOHN GORDON.

CLINICOSIS

SIR,—A family doctor salutes the wisdom of "Richard Cobbleigh" in your Widdicombe File last week. Out of the mouths of locum clinic officers. . . .

Cousin George does not go far enough. The refereeing is not a personal insult—it is the cause of unnecessary overtime, for the clinic gives advice cheerful in the knowledge that by the time the parent has found that the advice does not work the clinic will be shut and the family doctor can take over the work he should have had at first. In addition to his lack of knowledge of the family as a unit, the clinic doctor is handicapped by his inability to learn by his mistakes, for these are corrected by the family doctor who is thereby too busy to undertake the postgraduate education of office-hours doctors.

My remedy would be more drastic than Dr. Cobbleigh's. Sell the clinics, stop all further building of clinics. Invest this money, and with the money so obtained provide health visitors and part-time secretaries for the family doctors. The money usually spent on running the clinics can be used to provide general relief of rates and taxes. Allow the doctors so released from duplicated work to go to the underdoctored areas and join the ranks of which I am proud to be a member as a family doctor.

Bitterne, Southampton. ELDON STOWELL.

SIR,—Richard Cobbleigh should be his age. These caustic things have been said by one branch of the profession about another, ever since the cult of medicine began; they are stale, they are half-truths, they are terribly pharisaical. Why not go one further and acknow-

7. Stevenson, A. C. *Ann. Eugen., Lond.* 1953, **18**, 50.
8. Walton, J. N. *Ann. hum. Genet.* 1955, **20**, 1; *Ibid*, 1956, **21**, 40.
9. Michelson, A. M., Russell, E. S., Harman, P. J. *Proc. nat. Acad. Sci., Wash.* 1955, **41**, 1079.

ledge that people would be altogether better if all doctors were pensioned off? We could then translate the £400 million into houses, parks, schools, holiday camps, and the 101 things which this nation would have been constructing if its people felt themselves to be in the van and not in the rear, in social welfare.

F.R.C.P.

DERMATOLOGICAL OUTPATIENTS

SIR,—I wonder how many patients have had the same experience as some of those with whom I am acquainted. These people, who go to a variety of hospitals in and around London, complain that the dermatological departments are crowded; that they see a different specialist or assistant every time; that these specialists are always in a hurry; that the advice is disturbingly conflicting; and that, in short, there is no real continuity in treatment or study of individual needs. Though some of these patients have, of course, a strong emotional background to their dermatitis and to the complaint, I have nevertheless formed the impression that facilities for their supervision and treatment are quite inadequate. The aggregate cost to industry and the National Health Service must be immense, quite apart from considerable human suffering.

Speaking from an industrial angle, is it not time that organisation and treatment facilities were improved?

Farnham Royal, Bucks. M. E. M. HERFORD.

NOTIFICATION OF INFECTIVE HEPATITIS

SIR,—Your annotation of Oct. 6 says that "in this country infective hepatitis is not a notifiable disease." Although this statement is accurate as regards the country as a whole, it is nevertheless misleading in view of the fact—perhaps not generally known—that the disease is notifiable in counties of the Eastern region under the Jaundice Regulations of 1943.

You mention that dissemination of the disease is rapid when hygienic conditions are poor. Whilst this is undoubtedly true, I found [1] a high incidence (13 per 1000 estate population per annum) on a new housing estate, where the standards of environment were good but where the age structure of the population provided an unusually high proportion of susceptible persons. Children under 15 years old are predominantly affected by the disease, and populations on new housing estates contain a high proportion of this age-group.

Health Department, West Hartlepool. G. T. CROOK, Deputy Medical Officer of Health.

OMISSION OF PRESCRIBED P.A.S.

SIR,—The two valuable tests for *p*-aminosalicylic acid (P.A.S.) in the urine described by Dr. Penman and Dr. Wraith (Sept. 15) may well disclose, as they suggest, surprising numbers of patients omitting to take the drug, and even explain some of the growing number of cases resistant to other tuberculostatic drugs which the P.A.S. is intended to minimise.

Dr. Gordon (Oct. 13) recommends the compound drug 'Dipasic' as an alternative to separate P.A.S. and isoniazid; but this still leaves patients on other combinations such as P.A.S. and streptomycin.

Although some 10 g. of P.A.S. has to be taken daily to maintain a blood-level of, say, 40 µg. per ml., this in itself is not usually too formidable as the sodium or calcium salts are neutral, and the cachets can be swallowed one at a time during meals. Nausea, when it does occur, is in my experience most often, though not always, associated with a slight yellow discoloration of the drug due to its oxidation to the very irritant meta-amino phenol. A deeper colour, presumably from the same cause, can be seen in the urine, and incidentally in laboratory media incubated with the drug.

In view of the serious risks indicated by Dr. Penman and Dr. Wraith, and also by Dr. Gordon, when patients surreptitiously discontinue P.A.S., it is worth warning against attempting to take cachets when they are no longer white; and for individuals smaller packs might be prescribed.

Bacteriology Department, University of Glasgow. J. E. TINNE.

1. Crook, G. T. *Med. Offr*, July 6, 1956, p. 6.

CHOLECYSTANGIOGRAPHY

SIR,—Your annotation (Sept. 8) omits to mention two important aspects of cholecystangiography. The first is the value of this method in demonstrating unsuspected congenital anomalies of the cystic and common bile ducts. Whilst oral cholecystography still is the most valuable as a "scout" method, cholecystangiography is invaluable in demonstrating the status of the common duct and forewarning the surgeon of any congenital anomalies [1] (except vascular ones) that he may encounter at operation.

Secondly the value of cholecystangiography in the diagnosis of the acute abdomen [2] is not mentioned. The method provides a rapid means of evaluating the patency of the cystic and common bile ducts and forms a rapid means of excluding obstructive cholecystitis.

Johannesburg. ERIC SAMUEL.

KLINEFELTER'S SYNDROME

SIR,—In view of the interesting findings of Plunkett and Barr [3] in connection with sex-chromatin patterns in Klinefelter's syndrome, which suggest that it may be due to an embryonic abnormality rather comparable to that seen in Turner's syndrome, in which other congenital deformities such as disturbances of colour-vision [4] may be found, and in view of the light which this may throw on the possible genetic sex of these individuals, it appears to us that it would be interesting to test a moderately large group of cases of Klinefelter's syndrome for these abnormalities.

No one group of workers is likely to have many of these cases at their disposal, and we are therefore writing to suggest that others interested in this subject who have patients suffering from this condition might feel inclined to collaborate with us, and we should be very pleased if such workers would get in touch with us so that we could discuss plans for carrying out the necessary simple investigations.

Guy's Hospital, London, S.E.1. P. M. F. BISHOP, P. E. POLANI, M. H. LESSOF.

BOOKS FOR INDIA

Dr. EILEEN R. BARTER SNOW, principal of the Christian Medical College at Ludhiana, writes:

The Christian Medical College, founded in 1894 as the first medical school for women in India, now trains men and women medical students, who come to us from all parts of India and further afield. We are building up a good medical library, and I would like to ask authors and publishers of medical books whether they would send a copy of each book published to Ludhiana. American authors are very kindly doing this for us, and I am anxious that British medical thought should be well represented. We should be very grateful indeed for any such volumes donated. These may be sent direct to the college (Ludhiana, Punjab, India), or to the Secretary, Ludhiana British Fellowship, 12, Queen Anne's Gate, London, S.W.1, who will acknowledge and forward them.

1. Samuel, E. *Ann. R. Coll. Surg. Engl.* (in the press).
2. Samuel, E. *Indian J. Radiol.* 1956, Diamond jubilee no., p. 289.
3. Plunkett, E. R., Barr, M. L. *Anat. Rec.* 1956, **124**, 348.
4. Polani, P. E., Lessof, M. H., Bishop, P. M. F., *Lancet*, July 21, 1956, p. 118.

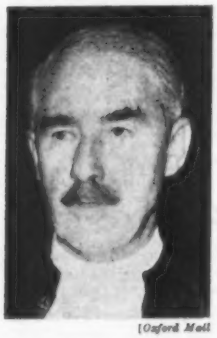
Obituary

ARTHUR QUINTON WELLS

M.A., D.M. Oxfd, M.A. Camb.

Dr. A. Q. Wells, the originator of the vole vaccine against tuberculosis, died on Oct. 9 while on holiday in Scotland. By his death medicine has lost an able research-worker and his friends a wise counsellor and a delightful companion.

He was born in 1896, the fifth son of Dr. Arthur Poulett Wells, an ophthalmic surgeon who practised in Harley Street. He was educated at University College School and then, following the family tradition, entered St. Bartholomew's Hospital. Before he had finished his dissection, the first world war broke out and he joined the R.N.V.R. as a surgeon sub-lieutenant. Some magnificent tattooing on his forearms remained as a lasting memento of Scapa Flow. After the war he went up to St. John's College, Oxford, and, having read the honours school in animal physiology, he returned to Barts where he qualified in 1923. He spent two years in general practice at Eyam in Derbyshire, memorable for the heroic immolation of its villagers during the Great Plague.



[Oxford Mail

In 1925 he visited New Zealand to see the work of Truby King and, returning through America, arrived in Boston when Minot and Murphy were initiating the liver treatment of pernicious anæmia. When he got back to England, encouraged by Prof. Francis Fraser he started his first piece of research—a controlled investigation of the merits of different liver preparations in pernicious anæmia. The results of this investigation were incorporated in a thesis for the D.M., which he received in 1928. Far more important, it convinced Wells that his real interest lay in the laboratory; he spent the next four years as a research student in the department of pathology at Cambridge, learning the techniques of experimental pathology and tissue-culture at the Strangeways Laboratory. In 1930 he was invited by E. H. Kettle to return to Barts as assistant bacteriologist and lecturer in bacteriology. There he gained experience in teaching and diagnostic bacteriology and carried out some investigations on the bactericidal effects of fatty acids. Already Wells had achieved that poise and appreciation of leisure which was so characteristic of him.

There was an occasion, a contemporary recalls, when the laboratories were being visited by the University Grants Committee, or some such body, on a hot summer's day. Kettle, as they approached Wells's room, told the visitors of the interesting work which was being done inside on experimental appendicitis. Kettle opened the door to reveal A. Q. sitting on a high stool on his bench with his feet in the sink, reading the *Times*; Wells lowered the paper and bade the deputation "good-day" and they moved on to the next laboratory.

The more formal work on experimental appendicitis was carried out with a Cattlin research fellowship, and it was Wells's first publication (*Brit. J. Surg.* 1937, **24**, 766).

The second turning-point in his career came in 1936 when he was invited by the Medical Research Council to become pathologist to the Bureau of Animal Population in the University of Oxford. Charles Elton had been making a large-scale study of the vole for some years and had observed remarkable fluctuations in the population of an area. It seemed possible that these were due to epidemic disease, and it was this problem that Wells began to investigate. Within a few months he found that a wild vole trapped in Scotland was heavily infected with an acid-fast bacillus which resembled *Mycobacterium tuberculosis* in appearance and on culture. It soon became apparent that this disease was widespread in the British Isles. His brief account of his discovery (*Lancet*, 1937, i, 1221) was at once recognised to be of considerable interest as, apart from rat leprosy, epidemic disease due to a mycobacterium had previously been unknown in wild animals.

Another facet of Wells's ability became apparent about this time. Sir Farquhar Buzzard and Sir William Goodenough were working together on a scheme for the regionalisation of hospital services. They soon recognised that Wells, apart from his special knowledge of pathology, had great breadth of vision; and this was to prove invaluable when the Nuffield Provincial Hospitals Trust was established in 1939. The part which Wells played, unostentatiously, at the meetings of the medical advisory council of that body had a considerable influence in preparing the ground for the National Health Service.

As a member of the Medical Research Council staff, Wells took part in the Emergency Public Health Laboratory scheme, and with the outbreak of war he departed for Gresham's School, Holt, with a technician and a collection of apparatus to set up an emergency laboratory. But no epidemics arose and, though his golf improved, he was anxious to continue his research on the vole bacillus; and so he returned to the Sir William Dunn School of Pathology at Oxford which housed the central laboratory of the P.H.L.S. of which he acted as administrator until its migration to Colindale.

Work on the vole bacillus had been hindered by the war, though evidence was accumulating that it was in fact a tubercle bacillus but of a new type, distinct from the human, bovine, or avian types (now generally known as the murine type). In 1940 Wells and W. S. Brooke found that the pathogenicity of the vole bacillus for the usual laboratory animals was very low though a high degree of tuberculin-sensitivity developed, and that in the guineapig subsequent infection with virulent bovine and human tubercle bacilli gave a degree of protection which was far greater than that obtained with B.C.G. Wells was fully aware of the possibilities of his observations, and also that it was imperative to move slowly, controlling each step with care.

He first showed that, though vaccination in guineapigs induced considerable resistance to subsequent infection with mammalian tubercle bacilli, it did not give complete protection; the development of tuberculous lesions was delayed and survival was much longer than in animals treated with B.C.G.; furthermore, with J. A. H. Wylie, he showed that tuberculous sensitivity is not co-terminous with resistance to infection and that, after tuberculous sensitivity is lost, the animals still retain the same degree of resistance to infection. When he considered the use of the vole bacillus for immunisation in man, he insisted on further criteria—especially safety and lack of local reactions. These investigations entailed a lot of work, travelling about the country and vaccinating volunteers, and all the while he was taking a full share in the work of the P.H.L.S. and the Nuffield Provincial Hospitals Trust. His work on the vole bacillus was published in 1946 in a joint report (no. 259) to the Medical Research Council in which, characteristically, the frontispiece is a delightful photograph of a vole peeping out from among grass and brambles.

The second stage of the investigation was a follow-up of more than 2500 people whom Wells and Wylie had vaccinated, and the results obtained—0·085% of the vaccinated group developed tuberculosis, against 2·35% in the unvaccinated controls—encouraged the Medical Research Council to institute in 1949 a clinical trial of B.C.G. and the vole vaccine. The first progress report, published this year, showed that the vole vaccine was at least as effective as B.C.G., but a true comparison between the two methods must await the later results of the trial. Large trials are also in progress in Rhodesia under the ægis of the Tuberculosis Research Association.

Wells was recognised as an expert on the problems of immunisation, and he served on many committees in this country; he had advised the World Health Organisation and visited South Africa to advise the government on tuberculosis prevention. He was far from satisfied that

immunisation with a living tubercle bacillus of low virulence was the right approach to protection, though it might be effective, and he was convinced that it was wrong to assume that an immunisation process that induced a high degree of tuberculin-sensitivity was necessarily the most effective in providing resistance to subsequent infection. In pursuance of these ideas, he was engaged, at the time of his death, in a large-scale experiment using various antigens analogous to the methanol antigen of Weiss and Dubos.

He took a serious interest in local affairs. He served on the Oxfordshire County Council from 1939 until 1945 and was chairman of the public-health committee; it was fitting recognition of his work that he was appointed High Sheriff of Oxfordshire, in Coronation year. He had been for some years a curator of the University Botanical Gardens and latterly chairman. From 1947 until 1950 he was chairman of the Oxford Regional Hospital Board, where his knowledge of the hospitals in the area, from the days when he was vice-chairman of the Oxford and district joint hospitals board, gave the board background and leadership.

A. H. T. R.-S. writes:

Reading his scientific papers, with the carefully planned experiments succinctly described, the attention to detail, the critical appraisal of his own and others' works, one might have thought of Wells as the retiring research-worker of fiction, and yet how different was the man. A. Q. had all the attributes of the 18th-century man of taste who understood the proper use of leisure; indeed, it was his appreciation of leisure that was his most charming characteristic. His friends were always welcome in his laboratory, and he gave you the impression that he had all the time in the world to talk about medical affairs and news, on which he was always well informed, and if there was a problem to discuss he would gently give you wise advice; his opinion and appraisal was much valued in and out of committees. But soon the conversation would turn to other matters—perhaps his alpine flowers, on which he was a considerable expert and of which he had a superb collection in the gardens he had created at Shipton Manor. Each spring he and his wife, who is also a knowledgeable botanist, would be off to Greece, Spain, or the French Alps, to collect rare plants and photograph them, for Wells was a fine photographer. He was also an excellent shot, a skilled stalker, and a good golf-player, but again it was all done without apparent effort. He had no interest in personal power and was well aware of the accidie which the unreal world of committees could induce; and so soon as he felt the Oxford Regional Hospital Board was established he resigned and returned to his scientific work. There is no doubt that, though he had achieved so much, there was much still for him to do.

J. M. V. also saw him as a figure of the 18th century who, "for our good fortune, had survived to enrich the Welfare State, which in odd ways he did himself so much to create."

He appeared always (she continues) to have infinite leisure. He was uninterested in personal power and the trappings of public office, though many public offices came his way. He was extremely distinguished and good-looking, usually wearing beautiful well-tailored tweeds, outstanding in any gathering. He lived in a lovely old Cotswold manor house where he entertained among his books and his flowers. The pheasants one ate for dinner he had shot, the peaches and the peas had come from his garden, and what a garden—full of rare and beautiful plants of every kind that he and his wife had brought home from the ends of the earth. Meeting him casually it appeared that his home and his large family were his background, that of a distinguished country gentleman; but through his work on hospital administration he did much in a quiet, unobtrusive way to mould the pattern of the health services as they exist in England today. As first chairman of the Oxford Regional Hospital Board he set his face against bureaucracy—"We must spend our money on doctors and hospitals, not on offices for ourselves and on a clerical staff." He was constantly on the road meeting members of his management committees, members of the medical and nursing staffs; patiently, and sometimes perhaps impatiently, arguing with local authorities and local politicians. He built up the Oxford service through personal knowledge of its problems and its people. Patterns he set here in Oxford have been followed throughout England, and yet what A. Q. really cared about was his research, and what will ensure that his name endures is his scientific work. Behind the achievement of his work lay his scientific friendships and the courage and counsel he gave to young pathologists who, especially in the war years of isolation, would turn to him for help. He listened and he laughed, and when one went away the problem somehow or other had ceased to be important or difficult. The pathologists came across England to the little church at Shipton-on-Cherwell that looks in at A. Q.'s study windows. They came because they loved him and the things he stood for—friendship and humility, laughter and the beauty of the countryside, good medicine for the people, and, above all, the rigid integrity of scientific investigation.

In 1925 he married Rhona Margaret, daughter of James Mason of Eynsham Hall. She survives him with five children; his third son has continued the family tradition and is a student at St. Bartholomew's Hospital.

DAVID ALBERT HUTCHESON

M.D. Aberd., D.P.H.

Dr. Hutcheson, honorary consultant physician to the Royal National Sanatorium, Bournemouth, died at his home in Bournemouth on Sept. 23 at the age of 79.

He was born in Aberdeenshire and educated in Aberdeen, qualifying in 1899. He continued his medical studies at the London Hospital, and in Berlin and Vienna. In 1903 he took the D.P.H., and the following year the degree of M.D. with commendation.

He became interested in tuberculosis and was one of the first assistant medical officers at King Edward VII Sanatorium, Midhurst. During the 1914–18 war he served as a captain in the R.A.M.C. In 1923 he was appointed clinical tuberculosis officer for Bournemouth, later becoming resident medical officer at the Royal National Sanatorium and then medical superintendent until his retirement in 1937. During the 1939–45 war he came out of retirement to resume this post when his successor was called up.

A. C. C. writes:

Dr. Hutcheson was an outstanding personality of the old school of physicians, whose ranks are steadily dwindling. His sound common sense inspired confidence in his patients and also in the younger doctors who came under his influence. A shrewd Aberdonian with a pawky sense of humour, he was a welcome guest at any function, although he was always a man who shunned publicity. A keen gardener, he was also an excellent golfer and bowler.

Appointments

BEDNARSKI, ANTONI, M.D. Warsaw, D.M.R.D.: assistant radiologist, Derbyshire Royal Infirmary.

BREWIN, T. B., M.B. Lond., M.R.C.P., D.M.R.T.: assistant radiotherapist, Hamilton Clinic, Ontario Cancer Foundation.

FAIRER, J. G., M.B. Lond., F.F.A. R.C.S., D.A.: consultant anæsthetist, Royal National Orthopædic Hospital, London.

FRASER, W. J., M.B. Edin., F.R.C.S.E.: part-time consultant general surgeon, Wharncliffe and City General Hospitals, Sheffield.

HOWIE, T. J. G., M.B. Glasg., D.P.H., D.OBST.: school M.O. and assistant M.O.H., Coventry.

HOYES, SHIRLEY E., M.R.C.S.: assistant M.O., Horncastle, Louth, and Skegness area.

MARTIN, R. W., L.R.C.S.I., D.P.H.: senior assistant M.O.H., Hove, and school M.O., East Sussex.

Liverpool Regional Hospital Board:

ANSELL, A., M.D. Lpool, D.M.R.D.: assistant radiologist, South Liverpool group of hospitals.

MACRAE, K. S. E., M.B. Lpool, F.R.C.S.: senior casualty officer, Warrington group of hospitals.

MOSSMAN, D. B., M.D. Lpool: consultant pathologist, Warrington group of hospitals.

RICKHAM, P. P., M.S. Lond., F.R.C.S.: consultant pædiatric surgeon, Alder Hey Children's Hospital and Royal Liverpool Children's Hospital.

Newcastle Regional Hospital Board:

CAMERON, SHEILA M., M.B. Durh., F.F.R., D.M.R.D.: consultant radiologist, Newcastle H.M.C.

FRASER, J. S., M.B. Edin., M.R.C.O.G.: consultant obstetrician and gynæcologist, South Shields H.M.C.

STONE, J. F., M.B. Edin.: senior casualty officer, Newcastle H.M.C.

TWEEDY, P. S., M.D. Lond., M.R.C.P.: senior casualty officer, Newcastle H.M.C.

Notes and News

RESEARCH ON SEASNAKE BITES

AT a meeting of the Royal Society of Tropical Medicine and Hygiene on Oct. 10, Dr. H. A. REID described four years' research on seasnakes. The original stimulus to this investigation had been the case of a fisherman admitted to Penang General Hospital in November, 1952, with, among other things, the clinical paradox of trismus and flaccid paralysis elsewhere. In hospital this patient had correctly forecast that he would die. He had been bitten by a seasnake. The Hydrophiidæ—seasnakes—constituted with the Elapidæ and Viperidæ the three poisonous snake families. Seasnakes inhabited coastal waters in a vast triangle bounded by the Persian Gulf, South Japan, the Western Pacific, and Northern Australia. They were especially common at river mouths. Their hallmark was a flat, rudder-like tail. Like the Elapidæ, they had short fixed fangs—enlarged "incisors"—connected by a duct along the upper gum with the relatively small venom gland behind the eye. Seasnakes were abundant, but fortunately they were not aggressive.

31 cases of seasnake bite had previously been reported. But this did not reflect the true incidence; for in a survey of fishing villages in North-west Malaya, Dr. Reid and his colleagues had secured records of 102 cases in the ten years after 1945, and of 42 cases before then. Of these 144 patients (41 fatal cases, 48 severe, 55 trivial) only 18 had gone to hospital. Death was due to respiratory failure. At necropsy scattered hæmorrhages, mostly petechial, were found in the abdominal and thoracic viscera; but naked-eye and microscopic examination of the nervous system was essentially negative. Recovery, where it took place, was swift, and there were no after-effects. In treatment Dr. Reid opposed any local or mechanical measures beyond rest. He administered antivenene intramuscularly along with hyaluronidase; but he was unconvinced that this measure was of value. Cortisone was helpful against serum reactions; and artificial respiration might be needed.

Dr. E. A. WRIGHT gave a preliminary report which suggested that the venom of seasnakes might act both centrally and peripherally.

Sir JOHN TAYLOR and Sir NEIL HAMILTON FAIRLEY, F.R.S., said that in their experience antivenene had proved of value. In reply, Dr. REID remarked that clinical judgment was difficult because often people had few or no symptoms after being bitten by a poisonous snake; and he had also seen people severely poisoned by snake-bite recover dramatically without antivenene. In-vivo experiments had shown antivenene to have a feeble action against neurotoxic snake-poisoning. Dr. Reid illustrated his remarks with two excellent colour films made by himself.

A NEW DESIGN FOR LIVING

To most people the words "a woman who goes out to work" are more likely to suggest a lady who obliges for three hours on two mornings a week than, say, Florence Nightingale setting off for the Crimea. In fact they are equally true of both and indeed of every woman, married or single, who leaves her home circle and its responsibilities to give whole-time or part-time, paid or voluntary, service to the community. Today they apply to about a third of the working population of Great Britain. The extent of this evacuation of the kitchen and the drawing-room is not perhaps fully appreciated, for women have slipped rather than marched out of the home. They have gone, gradually and sometimes almost by chance, to lend a hand in an emergency, or to earn some money in difficult times. But they have stayed, until today it is unusual for a single woman not to have a job and already every fourth married woman has one. A modern exodus of this size, which has every appearance of permanency and which is altering the domestic habits of the whole nation, deserves careful study, and Mrs. Myrdal and Miss Klein in their survey of the employment of women in France, Great Britain, Sweden, and the United States[1] offer a useful collection of facts which are too little known, as distinct from prejudices which are often too firmly held.

Their frank discussion of the difficulties—psychological, social, and economic—as well as the complementary benefits which employment has brought to women, and to their husbands, children, parents, and employers, is at once realistic and imaginative. They see the excursion of woman from the home as a response to the shifting pattern of her life. Her life-span has grown longer, her family has grown smaller, domestic help has become scarcer, labour-saving equipment has reached the kitchen and many traditional crafts have been removed from it to the factory. The composite result of these changes, Mrs. Myrdal and Miss Klein believe, is to give the married woman twenty years—say from the age of 45 to 65—when she is, by the admittedly exacting standards of modern life, underemployed. They believe that it will become more and more the accepted pattern of a married woman's life for her in the interval between child-rearing and retirement to hold a job as well as run a household. She might well be the more likely to follow this course if the help she offered the community were used, not as at present to increase productivity, but to shorten working hours for everyone. This would mean that women would not be driven to part-time work, which tends to be unsatisfactory and unsatisfying. It would also enable husbands and fathers, instead of being mere *visiteurs du soir*, to take a full share in family life. Mrs. Myrdal and Miss Klein's suggestions would bring further changes to the pattern of domestic life, but the design they suggest is worth considering.

1. Women's Two Roles: Home and Work. ALVA MYRDAL and VIOLA KLEIN. London: Routledge & Kegan Paul. 1956. Pp. 208. 25s.

DEEP DIVING

THE performance of Petty Officer William Bollard, who dived to 535 ft. in Loch Fyne in 1948,[1] has been beaten by Senior Commissioned Boatswain George Wookey, who dived to 600 ft. in Norwegian waters recently. A report in last Monday's *Times* states that the dive was done in a helmeted diving-suit, and the diver was supplied, from the Royal Navy's experimental diving-ship H.M.S. *Reclaim*, with a mixture of oxygen and helium to breathe. This mixture is a new device and enables a diver in a flexible suit to work at a depth of 430 ft. for a maximum of twenty minutes with as much ease a diver breathing air can at a depth of 100 ft. The most dangerous part of such diving is the period of decompression needed to avoid the "bends" (caisson disease). For a depth of 600 ft. this period is five and a half hours. When it is time for a diver to come up, a decompression chamber (a vertical cylinder with a door at each end) is lowered, complete with attendant, to him, and at a certain stage of the ascent the diver enters the chamber through the lower door. The attendant then takes charge, the pressure in the chamber is gradually lowered to the surface pressure, and pure oxygen is administered to the diver to hasten the elimination of the helium from the tissues of the diver's body.

University of London

At recent examinations for postgraduate diplomas the following were successful:

D.P.H.—Aly Heidar Yousef Abou-Ghareeb, Beatrice Colvin, D. O. Hasenbring, W. H. E. McKee, Rumesh Chandra Nauth-Misir, Margaret S. Parshall, E. P. Rigby, M. C. E. P. W. Samarasinghe, Chang-hyun Um.

D.C.P.—Canthavanam Chelliah Balasubramaniam, R. A. Cullen, R. S. Forrester, B. H. Gutteridge, C. A. Linsell, R. A. Rimington, Abdus Saleem, Nedjdet Gürgen Sanerkin, J. G. Wallace, R. M. Webster, F. D. White (academic diploma); Constance M. Bevan, Hirendra Nath Dutta, R. J. Elvy, Sunilkumar Gupta, Muhammad Ghulam Muazzam, Kathleen J. Rigg (external diploma).

University of Bristol

On Thursday, Nov. 1, at 8.15 P.M., Mr. T. Holmes Sellors will give the Carey Coombs lecture, on surgery of the thoracic aorta. Tickets may be had from the registrar of the University, Bristol, 8.

University of Birmingham

Dr. D. M. Matthews has been appointed lecturer in physiology, and Dr. D. S. Rowe and Dr. D. R. Stanworth have been appointed lecturers in experimental pathology.

Biochemical Society

A meeting of this society will be held at the Institute of Psychiatry, Maudsley Hospital, London, S.E.5, on Saturday, Nov. 17, at 2 P.M.

1. *Lancet*, 1948, ii, 399.

Royal College of Surgeons of England

At a meeting of the council on Oct. 11, with Sir Harry Platt, the president, in the chair, the Walker prize was presented to Dr. C. P. Rhoads of New York. The Cecil Joll prize for 1956 was awarded to Prof. P. R. Allison for his contributions to thoracic surgery. Mr. E. H. R. Altounyan, of Aleppo, Syria, was admitted to the fellowship, having been elected as a medical practitioner of twenty years' standing.

The Handcock prize was presented to Dr. R. D. C. Southcott (Guy's). Mr. J. M. Newbery (Cambridge University) was admitted as a Macloghlin scholar. Dr. G. H. Sloane-Stanley was elected H.N. Smith research fellow.

It was reported that Mr. Victor Riddell and Mr. George Armitage had been appointed as the college representatives to visit the U.S.S.R. during the autumn.

Diplomas were granted to the following:

F.R.C.S.—D. W. H. Hurley.

M.R.C.S.—F. W. Awobodu, P. C. Barrington, N. D. Kilpatrick, R. G. Rowe, T. B. Snell.

F.F.A.R.C.S.—D. E. Brown, C. C. Crampton, Shinmen Liu, A. R. de C. Peacock, Ian MacPhail, W. S. Davis, J. D. Lumsden, G. C. Davies, W. D. Meldrum, Barbara M. Rowe, T. D. Bourke, Richard Burtles, J. D. Howard, Jacob Levin, I. R. Verner, C. S. Ward, R. R. W. Hill, D. C. Hughes, D. G. Hurter, P. A. Skinner, R. S. Walsh, D. M. Jowell, T. J. L'Estrange, Teresa R. O'Rourke-Brophy, Bernard Wolfson, C. M. Conway, Laurence Langdon-Herring, Sheila M. Topping.

The following diplomas were granted jointly with the Royal College of Physicians:

D.C.H.—Darwish Ishaq Abdul-Latif, Frances Allan, Esther Almond, J. F. Andrewes, Prakash Chandra Bajpai, Elizabeth M. Beattie, Caroline D. Bell, Jacob Benatar, Sydney Brandon, Irene P. Brown, Joseph Brown, R. T. Bush, S. J. Carne, Alan Clark-Jones, D. E. Corlett, R. J. Cremer, A. C. B. Dean, Surjeet Singh Dhanjal, Etienne L. Dunnet, James Dutta, Jean A. Evans, Sheila H. E. Fairweather, J. C. Farrell, Shirley R. Fine, Marie J. Finney, J. S. Fitzsimmons, Diana E. Ford, I. A. Fraser, A. J. Fry, Anthony Gerada, Mylapore Ranga Gopalaratnam, S. G. Gordon, P. A. Gorman, Kamla Gupta, Umesh Saran Gupta, Judith M. Hall, L. M. Hart, Eileen E. Hill, Shih Chang Hu, Jean O. Hutchinson, Edna M. Irwin, Audrey Jones, Reuben Kaplan, Chandi Charan Kar, Sylvia J. Keet, Victoria K. Kelly, Nashatt Labib Khedairy, Indira Krupanidhi, Hazel M. Lazarus, A. M. Liebhold, Gillian A. Lomax, Rosemary H. McKinney, Pauline A. Manfield, Stella M. Manners, J. G. Masterson, Hazel R. Meacock, A. A. D. Moore, Ann E. Morgan, Jean E. Morris, J. E. Morris, R. B. Morris, S. E. L. Morris, R. A. C. Mulligan, Sheila J. Murrell, Zeeba Namazie, Jasmine C. Nanayakkara, Merle Newton, Verna S. Nicol, D. D. O'Sullivan, Mysore Narasimhachar Padma, Numanie Panditaratne, W. J. H. Paradice, J. F. Patterson, T. I. Perera, Mahenthiran Selvaraj Perinpanayagam, Diana J. Pippet, Elizabeth M. Price, Neilkmai Padidilian Rajendera, C. A. Rogerson, J. G. B. Russell, N. B. Sabiel, Satyendra Krishna Sarkar, D. C. Saunders, T. W. Seale, Margot Segall, Hem Sehgal, H. R. Simpson, Uma Shankar Prasad Singh, Elizabeth J. Steele, Sarojini Sud, J. D. Terrell, Eileen N. Thompson, Constance N. Vernier, P. G. Wells, R. S. Wells, Dennis Whitehouse, D. A. Whiting, E. P. Wilson, A. J. Winterton.

D.T.M. & H.—Iftikhar Ahmad, Gordhanbhai Jivabhai Amin, Alvarpillay Balakrishnan, Satya Brata Bhattacherjee, J. S. Carlisle, Pritam Dhir, Simon Diab, H. J. Fredericks, Mohammad Abdul Haleem, E. F. Harben, Tayeb Shakir Japanwala, Khairullah Abid Jasim, G. A. Jeffery, Albert Kagwa, Visuvalingam Kanagaratnam, J. A. Kay, Mohammad Amin Mahderbashi, Mary J. Marples, Kornkitch Mutirangura, Heinz Ochsner, Madhukar Manohar Pandit, O. H. D. Portsmouth, Mahmood Ahmad Qureshy, A. P. Roodvoets, A. H. B. Rydon, F. T. Sai, P. D. Samuels, Narinder Singh Satija, Johanna E. Schmitt, Mohammad Amin Seddiq, Chit Sein, I. D. Spark, J. F. H. Stewart, Mario Stilon-De Piro, Claire P. Thompson, Panchanan Tiwary, Albert Udawatte, Ravindra Gopaldas Wani, H. P. A. Wijetunge.

D.I.H.—R. T. S. Henderson.

D.O.—S. P. Kumar.

D.P.H.—K. M. M. Ansari.

D.A.—P. Honan.

Royal College of Obstetricians and Gynæcologists

Dr. H. F. Bettinger, director of the department of pathology of the Royal Women's Hospital, Melbourne, will give the John Shields Fairbairn lecture at the college, 58, Queen Anne Street, London, W.1, on Thursday, Dec. 13, at 5 P.M. He is to speak on unexpected maternal deaths without obvious gross organic lesions. Admission is by ticket only.

British Hospitals Contributory Schemes Association (1948)

At the annual general meeting of this association, held at Coventry on Oct. 11, Mr. Henry Lesser was re-elected president and Mr. John Dodd hon. secretary. Mr. W. Maxwell Mason was elected hon. treasurer. The annual report for 1955–56 shows that by the end of 1955 the number of contributors stood at 3,827,383, an increase of 120,901 (or 3%) over 1954. Income has risen by £350,358 to £2,736,048, an increase of 15% over 1954. The average weekly contribution for 1955 was 3·19*d.*, an increase of 0·33*d.* compared with 1954 and 0·98*d.* compared with 1950.

Conference on Cerebral Palsy

The British Council for the Welfare of Spastics is holding a conference for doctors at Bournville Girls' Technical School, Griffens Brook Lane, Bristol Road South, Birmingham, 30, on Saturday, Oct. 27, under the chairmanship of Prof. J. M. Smellie. The speakers will include Prof. R. S. Illingworth, Dr. Marjorie Wilson, Dr. Frances Braid, Dr. H. M. Cohen, and Mr. A. Innes. Further particulars may be had from the secretary of the council, 13, Suffolk Street, Haymarket, London, S.W.1.

Life Insurance Medical Research Fund of Australia and New Zealand

This Fund, which was established in 1952 to promote research on diseases of the heart and blood-vessels, has announced the following awards for 1956, amounting to about £25,000:

Grants-in-aid

Department of Pharmacology, University of Sydney: for further research, under the direction of Prof. R. H. Thorp, on the effect of drugs on the membrane resting and action potentials of single cardiac muscle fibres.

Department of Physiology, University of Sydney: for further research under the direction of Dr. P. I. Korner, on hæmodynamics of valvular incompetence.

Cardiac Department, Royal Melbourne Hospital: for research, under the direction of Dr. A. J. Goble, into the differentiation between acute myocardial infarction and acute myocardial ischæmia.

Clinical Research Unit, Alfred Hospital, Melbourne: for further investigation, under the direction of Dr. T. E. Lowe, of cardiac activity by physical methods.

Department of Medicine, University of Otago, Dunedin, New Zealand: for further research, under the direction of Prof. F. H. Smirk, into pathogenesis and clinical aspects of hypertension.

The Fund has also renewed a senior research fellowship held by Dr. F. B. Byrom for research on hypertension and toxæmia of pregnancy.

London Hospital Dinner

At the old students' dinner on Oct. 11 Dr. H. B. May, the dean, said that the hospital's new research building is largely completed, and the first half is occupied by five of the research units. When it was finished next May, it would be surpassed by no hospital building in London as a place for scientific research. The rehabilitation of the older buildings, including wards and theatres, should in five or six years bring them up to date. Among the year's events had been four clinical meetings for practitioners, which had been very successful and would continue. New members of the consultant staff were Dr. E. M. C. Dunlop (now assistant physician to the Whitechapel Clinic), Dr. J. W. Landells (for some years university reader in pathology at the hospital), and Mr. J. E. Richardson (appointed surgeon to the hospital in succession to the late Charles Donald). After thirty-six years as chairman of the college board, Colonel W. M. Pryor had been succeeded by his son, Mr. Matthew Pryor. In sport the year had been a good one: the hospital had won the soccer cup and had had no fewer than six rugby fifteens playing. The fencing, boxing, and rifle clubs had all won inter-hospital cups.

Sir Henry Souttar, proposing the Chairman, told of how Sir Henry Tidy's tendency, from early days, was towards clinical pathology, and of how, with the late Philip Panton, he laid the foundations of that great section of the London. Sir Henry Tidy, in his reply, described the early years of the century as a time of somnolence: he doubted whether there was ever a period of such sterility as 1903 to 1920. But insulin and liver had aroused the sleepers, and since then hardly a day had gone by without some fresh advance. It was alleged that the modern medical student is not taught to think and has lost his power of clinical observation. But the Greeks said that the only people one can teach to think are those who don't need teaching: and Sir Henry did not recollect that his own contemporaries spent very much time in reflection. As for clinical observation, he did not for a moment believe that it is in any way inferior today to what it was in the past—despite his story of the candidate who, when shown a patient with an enlarged spleen, remarked: "Well, it can't be the *kidney*, because of course *that* would be on the other side." To those who wondered how the Chairman could reconcile his loyalty to St. Thomas's and the London, he replied that one could be loyal to both wife and mother: and he was proud that the London had remembered her son.

The senior Londoner present at the dinner was Sir Henry Newland, former president of the Royal Australasian College of Surgeons. Greetings were sent to Sir Arthur Ellis (who would have presided but for indisposition) and Sir Robert Hutchison.

Call-up of Doctors in the United States

The defence department of the United States has decided to allow the special draft law for doctors to lapse next year. This law, which was first introduced in 1950 during the Korean war, extended the age-limit of the call-up for doctors from 35 to 50.

Aberdeen University Club, London

This club is holding its annual dinner at the Hyde Park Hotel, Knightsbridge, on Thursday, Nov. 8, at 7.30 P.M. The president is Prof. Robert Cruickshank, and tickets (30s.) may be had by all Aberdeen graduates from the secretary of the club, Central Public Health Laboratory, Colindale Avenue, N.W.9.

College of General Practitioners

Midland Faculty.—The college has arranged with the staffs of the Worcester Royal Infirmary and Ronkswood Hospital for six medical meetings to take place this autumn. The first will be held on Thursday, Oct. 25, at 3.15 P.M., when Dr. M. Ivor Cookson and Mr. A. T. Marshall will speak on antenatal care. Further particulars may be had from Dr. A. J. Laidlaw, Thorneloe Lodge, 29, Barbourne Road, Worcester.

Association of Anæsthetists of Great Britain and Ireland

The annual meeting of this association will be held in London at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Thursday and Friday, Nov. 1 and 2. The programme will include the Frederic Hewitt lecture by Dr. Ronald Woolmer, on Artistry and Science in Anæsthesia. Further particulars may be had from the secretary of the association, 45, Lincoln's Inn Fields, W.C.2.

Royal Society Antarctic Expedition

Colonel Robin Smart, deputy director of Army health, Western Command, Chester, has been appointed leader of the main party of this expedition. The party will leave London Docks on Nov. 15 and will relieve the advance party who sailed from Southampton on Nov. 22 last year, under the leadership of Surgeon Lieut.-Commander David Dalgliesh, R.N. Colonel Smart will return to the United Kingdom at the beginning of January, 1958, but the main party will remain at Halley Bay until the end of the International Geophysical Year on Dec. 31, 1958.

Convalescent Treatment in the N.H.S.

The Minister of Health has appointed a working party:

To examine the extent to which the provision of convalescent homes in the National Health Service is meeting the demands placed upon it in the light of recent advances in medicine and modern conceptions of treatment and nursing care, and to review the admissions machinery in the London area.

The chairman of the working party will be Dr. N. M. Goodman, a principal medical officer of the Ministry, and the secretary Mr. L. B. Jacques, also of the Ministry. The members and the outside organisations they represent are:

Captain H. Brierley (Teaching Hospitals Association); Sir Henry Tidy, F.R.C.P., and Commander R. W. Peers (King Edward's Hospital Fund for London); Miss A. B. Reed and Miss M. J. Roxburgh (Institute of Almoners); Dr. James Graham and Mr. B. J. Lord (Metropolitan regional hospital boards); and Dr. R. A. Andrews (general practitioner).

CORRIGENDA: *Triiodothyronine in Myxœdema Coma.*—In last week's article by Dr. A. Dyson and Dr. M. W. W. Wood, "50–100 μg.," *not* "50–100 mg.," should have appeared in the penultimate line of the section headed triiodothyronine on p. 759.

Infection of Volunteers by A.P.C. Type-1 Virus.—In table II of the article by Dr. A. T. Roden and his colleagues (Sept. 22, p. 592) the first entry for volunteer L should have been dated May 11.

Miss F. G. Goodall, general secretary of the Royal College of Nursing, has been appointed chairman of the staff side of the Nurses and Midwives Functional Whitley Council for the National Health Service.

Dr. W. Mayer-Gross, of the Birmingham University department of experimental psychiatry, has been asked by the World Health Organisation to advise on the further development of the All-India Institute of Mental Health, Bangalore, Southern India. He will be away from the middle of October till the end of February, 1957.

Lieut.-Colonel H. J. Bensted has retired from the directorship of the Central Public Health Laboratory at Colindale, but he will continue to serve as editor of the *Journal of Hygiene*. Dr. W. C. Cockburn is acting as director of the laboratory until Colonel Bensted's successor is appointed.

Diary of the Week

OCT. 21 TO 27

Monday, 22nd

MANCHESTER MEDICAL SOCIETY
7.30 P.M. *Odontology.* (Clinical Sciences Building, York Place, Manchester, 13.) Dr. Alistair French: The Law and the Dental Surgeon.
9 P.M. *General Practice.* Dr. Richard Scott: General Practice with Special Reference to Undergraduate Education.

Tuesday, 23rd

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. L. W. Proger: Osteomyelitis. (Erasmus Wilson demonstration.)
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Medicine.* Dr. R. Hudson, Dr. R. S. Stacey: Malignant Carcinoid Tumours. Dr. Donald Ball: Endomyocardial Fibrosis. Dr. Richard Bayliss: Primary Amyloidosis.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Prof. H. Harvey Evers: Significance of Rubella in Early Pregnancy.
BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. V. P. Whittaker: Metabolism of Choline Esters.
INSTITUTE OF DERMATOLOGY, Lisle Street, London, W.C.2
5.30 P.M. Dr. Arthur Tickner: Vitamins and Skin Metabolism.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. *History of Medicine.* Dr. Denis Leigh: Recurrent Themes in the History of Psychiatry.

Wednesday, 24th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Endocrinology.* Dr. Russell Fraser: Diagnostic Procedures in Bone Disease. (Presidential address.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. George Popjak: Fat Metabolism.
UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Prof. A. Charlotte Ruys: Influence of Environmental Conditions on the Epidemiology of Tuberculosis.
WESTMINSTER HOSPITAL
5.30 P.M. (17, Horseferry Road, S.W.1.) Prof. H. K. Beecher (Boston, Mass.): Treatment of Severely Wounded Men.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. Cicely Williams: Needs and Opportunities for Maternal and Child Health in International Organisations.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. D. I. Williams: Vitamins in Dermatology.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, London, S.W.3
5 P.M. Mr. J. R. Belcher: Mitral Valvotomy.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Pathology.* Dr. G. H. Lathe: Clinical and Biochemical Aspects of the Serum Bile-pigments.

Thursday, 25th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Dr. William Brockbank: The Man who was Vidius. (Thomas Vicary lecture.)
ROYAL SOCIETY OF MEDICINE
8.30 P.M. *Urology.* Dr. Cuthbert Dukes: Behind the Scenes in Urology. (Presidential address.)
UNIVERSITY OF LONDON
5 P.M. (St. Thomas's Hospital Medical School, S.E.1.) Sir Geoffrey Jefferson, F.R.S.: Effects of Brain-stem Lesions.
UNIVERSITY COLLEGE LONDON, Gower Street, W.C.1
5.30 P.M. Sir Gavin de Beer, F.R.S.: Science and the Humanities. (Rickman Godlee lecture.)
ROYAL EYE HOSPITAL, St. George's Circus, S.E.1
5.15 P.M. Dr. T. H. Whittington: The Reduced Eye and Retinoscopy.
BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Dr. Mary Barber: Resistance of Staphylococci to Antibiotics.
LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
8 P.M. Dr. J. P. G. Rogerson, Mr. H. V. Corbett: General-practitioner Midwifery Services.
HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Mr. I. S. Smillie: Loose Bodies in Joints.
ST. ANDREWS UNIVERSITY, Queen's College, Small's Wynd, Dundee
5 P.M. Prof. G. M. Wyburn: Limitations of the Interpretation of Structure with the Electron Microscope.

Friday, 26th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Pædiatrics.* Dr. D. V. Hubble: Hormonal Influences on Growth. (Presidential address.)
8.15 P.M. *Obstetrics and Gynæcology.* Mr. Alan Brews: Developmental Anomalies of the Female Genito-urinary Tract. (Presidential address.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Mr. David Band: Personal Experience of Methods of Vesical Exclusion with a Reasonable Follow-up.
4 P.M. Sir Francis Walshe, F.R.S.: The Traumatic Neurosis.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Louis Forman: Alopecia.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.1
3.30 P.M. Mr. Maxwell Ellis: Secretory Otitis and Eustachian Obstruction.

Saturday, 27th

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
9.45 A.M. (Hammersmith Hospital, London, W.12.) Prof. W. I. C. Morris: Postmaturity.

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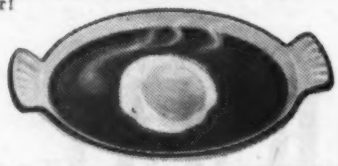

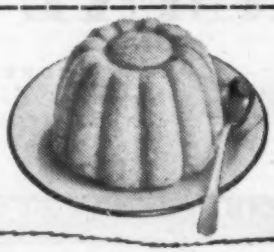

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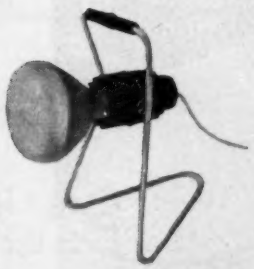

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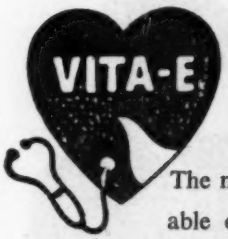

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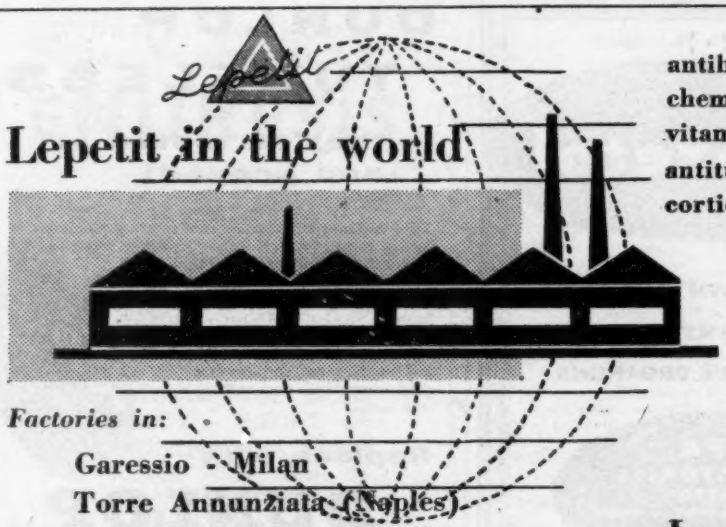

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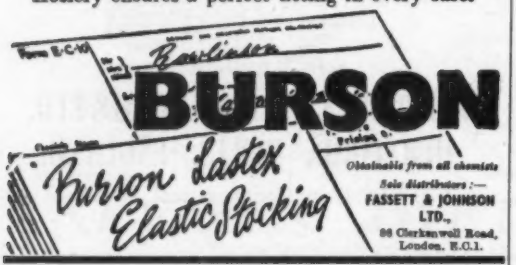

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A COURSE OF INSTRUCTION IN RADIOTHERAPY will begin at the Christie Hospital and Holt Radium Institute, Manchester, in APRIL, 1957. This will continue until the end of JANUARY, 1958, after which students must still spend a further 15 months working either in the Holt Radium Institute or in another approved hospital. The course is full-time, non-resident, and the inclusive fee for the 10 months is £52.

Applications are invited from registered medical practitioners who fulfil the requirements as to previous medical experience laid down by the Examining Board in England (D.M.R.T. regulations obtainable from the London Conjoint Board, 8–11, Queen-square, London, W.C.1).

Applicants from Great Britain may be eligible for Senior House Officer appointments. Special consideration will be given to candidates possessing a higher qualification in medicine or surgery, and Registrar appointments may be available for such candidates.

Further information may be obtained from Dr. RALSTON PATERSON, Director, Christie Hospital and Holt Radium Institute, Wilmslow-road, Manchester, 20, or from the Dean of Postgraduate Medical Studies, The University, Manchester, 13, to whom applications should be sent not later than 5th January, 1957.

TAVISTOCK CLINIC

DISCUSSION GROUP SEMINAR ON PSYCHOLOGICAL PROBLEMS IN SPECIALIST AND HOSPITAL PRACTICE

A COURSE of 8–10 discussion meetings for a limited number of Consultants and other Senior Medical Hospital Staff will start in November. Day and time of meeting to be arranged to suit participants. If sufficient number apply, groups may be arranged according to specialty or seniority. Admission free.

Apply in writing for further particulars to Medical Director, Tavistock Clinic, 2, Beaumont-street, W.1, stating possible times for attending.

THE LONDON HOSPITAL MEDICAL COLLEGE

COURSE IN ADVANCED MEDICINE

A Postgraduate Course in Medicine will be held at The London Hospital commencing MONDAY, 7TH JANUARY, and finishing FRIDAY, 15TH MARCH, 1957. Classes will be held on Mondays, Wednesdays and Fridays. The course will be limited to 24 students.

Applications should be made to the Dean. The fee for the whole course will be 35 guineas, and for Old Londoners 15 guineas.

H. B. MAY, M.A., M.D., F.R.C.P., Dean.
The London Hospital Medical College, Turner-street, E.1.

INSTITUTE OF ACCIDENT SURGERY

(In conjunction with the Board of Graduate Studies, The Medical School, University of Birmingham)

A COURSE ON THE TREATMENT OF INJURIES
BIRMINGHAM ACCIDENT HOSPITAL
3RD–7TH DECEMBER, 1956
PROGRAMME

Monday, 3rd December		
2 P.M.	Organisation of an accident service	Mr. WILLIAM GISSANE
3 P.M.	Reception and primary treatment of major injuries	Mr. RUSCOE CLARKE
Tuesday, 4th December		
10 A.M.	Prevention and treatment of shock in trauma	Mr. RUSCOE CLARKE
11.30 A.M.	Burns (1)	Mr. DOUGLAS M. JACKSON
2 P.M.	Prevention and treatment of wound infection	Mr. P. S. LONDON
3.15 P.M.	Burns (2)	Mr. DOUGLAS M. JACKSON
5 P.M.	Demonstration — Bacteriology of wound infection	Dr. E. J. L. LOWBURY
Wednesday, 5th December		
9.30 A.M.	Fractures of the upper limb	Mr. F. G. BADGER
10.45 A.M.	Fractures of the neck of the femur	Mr. WILLIAM GISSANE
12 NOON	Fractures of shaft of femur	Mr. RUSCOE CLARKE
2 P.M.	Tour of the hospital and ward round	
3.15 P.M.	Some problems of the fixation of fractures	Mr. J. H. HICKS
5 P.M.	Discussion on fractures	
Thursday, 6th December		
10 A.M.	Thoracic injuries	Mr. A. L. D'BREU
11.30 A.M.	Abdominal injuries	Mr. P. S. LONDON
2 P.M.	Hand injuries	Mr. WILLIAM GISSANE
3 P.M.	Demonstration of blood volume techniques	Dr. ELIZABETH TOPLEY
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10.45 A.M.	Open fractures	Mr. F. G. BADGER
12 NOON	Head injuries	Mr. J. M. SMALL
2 P.M.	General discussion	

Arrangements will be made to provide facilities for those taking part in the course to attend emergency operations as they occur.

The fee for the Course (including lunch and tea) is 7 guineas.

Applications and inquiries should be addressed to the Secretary, Institute of Accident Surgery, Birmingham Accident Hospital, Bath-row.

UNIVERSITY OF LONDON

A LECTURE entitled "Influence of Various Environmental Conditions on the Epidemiology of Tuberculosis" will be given by Prof. A. CHARLOTTE RUYS (Amsterdam) at 5.30 P.M., on 24TH OCTOBER at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF LONDON

A LECTURE on "The Effects of Brain-stem Lesions" will be given by Prof. Sir GEOFFREY JEFFERSON at 5 P.M. on 25TH OCTOBER at St. Thomas's Hospital Medical School, Albert-embankment, S.E.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

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PRACTICAL REVISION CLASS FOR PART II D.L.O. STUDENTS

To include applied anatomy, histology, morbid anatomy, case-demonstrations, demonstrations of instruments and apparatus, practice examination papers, &c., from 28th NOVEMBER to 11TH DECEMBER, 1956.

Fee £6 6s.

Detailed syllabus obtainable from the Dean.

GRESHAM COLLEGE, Basinghall-street, London, E.C.2

Tel. MONarch 2433

4 LECTURES by Prof. J. L. D'SILVA, D.SC., M.R.C.P. (Gresham Professor in Physic) on "The Function of the Body Under Conditions of Stress" on MONDAY–THURSDAY, 22ND–25TH OCTOBER.

The Lectures are free and begin at 5.30 P.M.

BRITISH POSTGRADUATE MEDICAL FEDERATION.

(UNIVERSITY OF LONDON.) SCIENCE GRADUATE preferably with experience in clinical biochemistry, to work on metabolic studies at the Institute of Orthopædics, Royal National Orthopædic Hospital, Stanmore, Middlesex. Salary £600–£50–£700. Subject to F.S.S.U.

Applications to the Dean, Institute of Orthopædics, 234, Great Portland-street, London, W.1.

THE UNIVERSITY OF MANCHESTER. Applications for the post of LECTURER IN SOCIAL AND PREVENTIVE MEDICINE are invited from registered medical practitioners. The post is a joint appointment between the University and the Health Authority of a neighbouring area of Lancashire, whereby the person appointed, in addition to carrying out lecturing duties at the University, will carry out duties as an Assistant Medical Officer and School Medical Officer in the area concerned. Salary on a scale rising to £2000 p.a. with membership of F.S.S.U. and children's allowance scheme. Initial salary fixed according to qualifications and experience.

Applications should be sent not later than 10th November, 1956, to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF BRISTOL. Applications are invited from Medical Graduates for the post of LECTURER IN BACTERIOLOGY. The duties include the teaching of both medical and science undergraduates. Salary will be within the range of £1000–£100–£1750 together with superannuation and children's allowances.

Further particulars may be obtained from the Registrar to whom applications, with the names of 3 referees, should be sent not later than 17th November.

Hospital Services : Senior Appointments

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT GYNÆCOLOGIST (2 half-days per week) in the Battersea and Putney Group, for duty at Bolingbroke Hospital, S.W.11.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 10th November, 1956. Applicants may visit Hospital by local arrangement.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Cheshire Joint Sanatorium** (305 Beds)

Whole-time CONSULTANT CHEST PHYSICIAN AND DEPUTY MEDICAL SUPERINTENDENT. Duties also at chest clinics in Stoke-on-Trent area. Wide experience specialty/higher qualification required.

(2) **Dudley and Stourbridge Group**

(*a*) Part-time CONSULTANT ANÆSTHETIST (9 notional half-days weekly). Duties mainly at Guest Hospital, Dudley (154 Beds); also at Wordsley Hospital (372 Beds); Corbett Hospital, Stourbridge (106 Beds).

(*b*) Part-time CONSULTANT ANÆSTHETIST (8 notional half-days weekly). Duties at Wordsley Hospital (6 notional half-days) and Corbett Hospital (2 notional half-days). Both posts experience specialty and either D.A. (Parts I and II) or F.F.A.R.C.S. required.

Applications (15 copies), stating name, age, qualifications, and naming 3 referees, to Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, by 5th November, 1956.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR HOSPITAL MEDICAL OFFICER in Psychiatry required for duties at Broadgate Hospital, Beverley, for November and December, 1956.

Applications, stating age, qualifications and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

CARDIFF. THE UNITED CARDIFF HOSPITALS. (Joint appointment with Welsh Regional Hospital Board.) The Board of Governors of the United Cardiff Hospitals and the Welsh Regional Hospital Board invite applications from suitably qualified medical practitioners for the post of CONSULTANT ANÆSTHETIST (full-time or maximum part-time). The successful candidate will work mainly in the United Cardiff Hospitals.

Applications, with the names of 3 referees, should be sent to the Secretary to the Board, United Cardiff Hospitals, Cardiff Royal Infirmary, Cardiff, not later than 27th October, 1956.

LEEDS REGIONAL HOSPITAL BOARD.

Whole-time CONSULTANT PSYCHIATRIST AND PHYSICIAN-SUPERINTENDENT, Menston Hospital, near Leeds (2500 Beds). The duties of the appointment will also include attendances at the Bradford Royal Infirmary and such other extramural duties as may be required at associated general hospitals. Candidates should hold high qualifications in medicine and psychiatry and have had experience of administrative aspects of the specialty. A modern house is available in the Hospital grounds.

Whole-time ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer scale) for duties at hospitals in the Hull A, Hull B and East Riding Hospital Management Committee Groups. Applicants should have had wide experience in radiology and the possession of the D.M.R. is essential. The successful candidate will work under the general guidance of the Consultant in charge of the department and will be required to reside in or near Hull.

Part-time (8 notional half-days per week) ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer scale) for duties at the Royal Eye and Ear Hospital, Bradford, and the Bradford, Dewsbury and West Riding County Council School Clinics; the person appointed to reside in Bradford.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale) for duties at Storthes Hall Hospital (2680 Beds), Kirkburton, near Huddersfield, and associated clinics at general hospitals. Applicants should hold the D.P.M. or other equivalent qualifications. Resident or non-resident. A large modern flat is available if required and accommodation is also available for a single person.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 24th November, 1956.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of Part-time (9 sessions) SENIOR HOSPITAL MEDICAL OFFICER (non-resident). Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications, giving details of past experience and qualifications, together with the names of 3 referees, to be addressed to the undersigned as early as possible. (Special application forms can be obtained on request.)

F. J. CABLE, Secretary, United Manchester Hospitals.

The Lodge, Oxford-road, Manchester, 13.

NEWCASTLE REGIONAL HOSPITAL BOARD. ST. LUKE'S HOSPITAL, MIDDLESBROUGH. Locum Tenens PSYCHIATRIST (Senior Hospital Medical Officer), whole-time, for 2/3 months.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, immediately.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT ANÆSTHETIST (3 half-days a week), Watford Hospitals. (Peace Memorial Hospital, 196 Beds; Shrodells, 379 Beds; Watford Maternity, 58 Beds). Hospitals may be visited by arrangement with the Hospital Secretary, Peace Memorial Hospital, Watford, Herts.

Applications before 19th November, 1956.

(2) CONSULTANT RADIOLOGIST (3 half-days a week) Harefield Hospital, Harefield, Middlesex (620 Beds). Hospital may be visited by direct appointment.

Applications before 21st November, 1956.

(3) CHILD PSYCHIATRIST (4 half-days a week), Senior Hospital Medical Officer grade, Bedfordshire Child Guidance Service. Duties will cover the service in the southern part of the County, and will be based on the Clinics at 11, Gordon-street, Luton, and Health Centre, Dunstable, which may be visited by direct appointment.

Applications before 28th November, 1956.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Whole-time SURGEON of Consultant status for the Winchester Group of hospitals. The successful candidate's main duties will be in the Alton area and he will be required to undertake at least 1 session weekly in the Lord Mayor Treloar Group, Alton. Included in his work will be limited administrative medical duties at the Alton General Hospital. Residence in or within 10 miles radius of Alton is a condition of the appointment. Remuneration will be on the basis of 8/11ths for clinical consultative duties and 3/11ths for administrative duties, in accordance with M.D.B. Circular No. 14. Canvassing will disqualify, but candidates may visit the hospitals by arrangement with Mr. F. R. Reeves, F.H.A., Group Secretary, Winchester Group Hospital Management Committee, Royal Hampshire County Hospital, Winchester; and with Mr. S. W. Cane, F.H.A., Group Secretary, Lord Mayor Treloar Group Hospital Management Committee, Alton.

Applications (7 copies), stating age, qualifications and experience, and the names and addresses of 3 referees, to the Area Secretary, South West Metropolitan Regional Hospital Board, Highcroft, Romsey-road, Winchester, by 10th November, 1956.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Whole-time ASSISTANT GERIATRIC PHYSICIAN (Senior Hospital Medical Officer grade) for the Southampton Group of hospitals. The Geriatric Department is in the charge of a Consultant Physician and consists of an Admission Unit of 55 Beds in the Southampton General Hospital and 310 "long-stay" beds in other hospitals in the Group. The successful candidate will be required to undertake the domiciliary assessment of patients on the waiting list and maintain close liaison with the General Practitioners and the Local Health Authorities. Canvassing will disqualify but candidates may visit the hospitals concerned by arrangement with F. Jennings, Esq., F.H.A., F.C.C.S., Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

Applications (7 copies), stating age, qualifications and experience, and giving the names and addresses of 3 referees, to the Area Secretary, South West Metropolitan Regional Hospital Board, Highcroft, Romsey-road, Winchester, by 10th November, 1956.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at Brookwood Hospital, Knaphill, Woking, Surrey. Candidates should have good psychiatric experience and possess D.P.M. The post is non-resident.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 10th November, 1956. Applicants may visit Hospital by local arrangement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT PSYCHIATRIST based at Glengall Mental Hospital, Ayr. House available. Salary (at age 32 and over) on the scale £1575–£50–£2025. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL SUPERINTENDENT of the Inverness Group of hospitals. The salary scale is £1700–£75(2)–£1850–£100–£1950. A house is available at the Royal Northern Infirmary, Inverness.

Schedules of application and further particulars of the post are obtainable from the undersigned, with whom applications should be lodged by 3rd November, 1956.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SHEFFIELD REGIONAL HOSPITAL BOARD. Part-time CONSULTANT ORTHOPÆDIC SURGEON required for 8 notional half-days per week for the Mansfield Hospital Area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 17th November, 1956.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD, DUNEDIN, NEW ZEALAND. Applications are invited for the position of DIAGNOSTIC RADIOLOGIST, Otago Hospital Board. Applicants must hold a degree in medicine of an approved university and possess a higher qualification in the specialty. The salary payable will be that of a Junior or Senior Specialist under the Hospital Employment Regulations, viz.: £1600–£2300 p.a. The commencing salary will be determined in accordance with the qualifications and experience of the appointee. The position is a full-time and non-resident one. Travelling expenses as set out in the conditions of appointment will be paid when a contract of service is signed.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, Strand, London, or from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2. Applications, stating age, qualifications and experience, together with testimonials, Health and Radiological Certificates, will be received by the undersigned until 10 A.M. on Monday, 21st January, 1957.

W. A. WILLIAMSON, Secretary, Otago Hospital Board.

P.O. Box 946, Dunedin, New Zealand.

TASMANIA. LAUNCESTON GENERAL HOSPITAL LAUNCESTON. Applications, in duplicate, addressed to the Agent General for Tasmania, 457, Strand, London, W.C.2, and closing on 10th November, 1956, are invited from medical practitioners registrable in Tasmania for appointment to the position of PSYCHIATRIST. The position is a full-time appointment at the Launceston General Hospital.

Qualifications: Preference will be given to the candidates in possession of 1 or more of the following higher qualifications—M.D., M.R.C.P., M.R.A.C.P., and/or D.P.M. Experience in psychiatry is essential.

Normal working hours from 9 A.M. to 5.30 P.M., Monday to Friday inclusive, with emergency calls as required. Limited consultative private practice outside these working hours is permitted.

Salary range: £A2500–£100–£3000.

Annual recreation leave: 28 days.

Superannuation benefits available.

An assisted passage can be arranged through the Agent General for Tasmania.

Accommodation: A house is available, if required, on a rental basis.

Further particulars available from the Agent General for Tasmania.

MALAYA. THE LADY TEMPLER HOSPITAL, Kuala LUMPUR, MALAYA. The Board of Governors of The Lady Templer Hospital, Kuala Lumpur, invite applications from those of Consultant rank possessing considerable experience in chest anæsthesia, including pulmonary, œsophageal and cardio-vascular work, for the appointment of ANÆSTHETIST. The Hospital is modern with fully up-to-date ancillary services. The appointment will be full-time, and for a period of 3 years. Salary will be between $1700 and $2000 (Malayan dollars or £198 and £233) per month, inclusive of basic pay and allowances. Free, partly furnished quarters will be provided; local leave at the rate of 14 days p.a. will be granted, and at the end of each tour of service fully paid (basic) leave at the rate of 5 days per month of completed service will be granted. First-class passages to and from the country of domicile for officer, wife, and a maximum of 3 children under the age of 10 years will be paid at the beginning and end of each tour. On satisfactory completion of his contract the officer will receive a gratuity of between £350 and £450 (Sterling) p.a., depending on basic salary, for each completed year of service.

Applications, stating date of birth, marital status, qualifications and experience, with the names of 3 referees, to be sent care of House Governor, Brompton Hospital, Fulham-road, S.W.3, by 14th November, 1956, from whom further details may be obtained on request.

Hospital Services : Junior Appointments

ALL SAINTS' HOSPITAL, Austral-street, West-square, London, S.E.11. WESTMINSTER HOSPITAL TEACHING GROUP. Applications are invited for the post of SURGICAL REGISTRAR (urological) for 1 year in the first instance, from 1st January, 1957. The appointment is subject to the terms and conditions of service of hospital medical and dental staffs. The post is primarily for the Urological Department but some general surgery is also included; it offers time for postgraduate study and there is access to clinical medicine throughout the Group.

Applications (6 copies), and the names of 2 referees, should reach the Secretary at the above address not later than 15th November, 1956.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (medical), whole-time, non-resident, for 1 year in the first instance from 1st February, 1957.

Forms of application from the Secretary, Battersea and Putney Group Hospital Management Committee, 54, Upper Richmond-road, S.W.15, to whom they should be returned within 14 days.

CHARING CROSS HOSPITAL, W.C.2. Senior Registrar in the Radio-diagnostic Department (full-time) non-resident. Tenable from 1st January, 1957, for 1 year in the first instance, with eligibility for renewal.

Applications on forms to be returned to the undersigned by 31st October, 1956. FRANK HART,
House Governor and Secretary to the Board.

CHINGFORD HOSPITAL, London, E.4. Clinical ASSISTANT (temporary) required. On-call duties equivalent to 3 notional half-days per week. £525 p.a.

Applications, with full details and copies of 2 recent testimonials, to be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow. E.17. (118 Beds.) HOUSE SURGEON required for 6 months (General Surgery and Special Departments). Post vacant 1st December, 1956. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committtee, Forest Group, Langthorne-road, E.11.

FOUNTAIN GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. A REGISTRAR is required to assist in research in the pathology of mental deficiency at the Fountain Hospital Department of Neuropathology. Training will be given to a suitable candidate. The Fountain Hospital Group has 800 Beds, mainly for children. Canvassing will disqualify, but candidates may visit the Hospital by appointment and the annual report is available on application.

Application forms from Secretary, Fountain Hospital, Tooting-grove, London, S.W.17.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR (part-time) in Ophthalmology at Guy's Hospital, with duties on 2 sessions per week. The appointment will be for 1 year in the first instance, commencing as soon as possible.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 1st November, 1956.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR (part-time) in the Department of Venereal Diseases at Guy's Hospital, being combined with the Seamen's Hospital, Greenwich, with duties at Guy's only for 6 sessions per week. The appointment will be until 30th September, 1957, in the first instance, commencing as soon as possible.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 1st November, 1956.

GUY'S MAUDSLEY NEUROSURGICAL UNIT. Applica-tions are invited for the resident post of SENIOR HOUSE OFFICER for 6 months, commencing on 1st December, 1956. The unit, which is housed in the Maudsley Hospital, serves Guy's Hospital, and the Bethlem Royal Hospital and the Maudsley Hospital.

Applications should be made within 2 weeks of the appearance of this advertisement to—

K. J. JOHNSON, House Governor and Secretary.
Maudsley Hospital, Denmark-hill, S.E.5.

GERMAN HOSPITAL, Dalston, London, E.8. (General —157 Beds.) Applications are invited for the 12 months appointment (vacant early November) of RESIDENT CASUALTY OFFICER (Senior House Officer grade) and should be sent to Group Secretary, Hackney Hospital, London, E.9, quoting GH/SHO.

HACKNEY HOSPITAL, London, E.9. (General—341 Beds.) Applications are invited from registered practitioners for the 6 months appointment (vacant 28th November) of RESIDENT CASUALTY OFFICER AND HOUSE PHYSICIAN (Skin Department), House Officer grade, and should be sent to the Secretary, above address, quoting HH/COS.

HACKNEY HOSPITAL, London, E.9. (General—341 Beds.) Applications are invited for the resident appointment (for a period of 6 months in the first instance) of SENIOR HOUSE OFFICER (orthopædic), post vacant mid-November and should reach the Secretary at above address by 23rd October quoting HH/SHO/O.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (E.N.T.) required early January. F.R.C.S. or D.L.O. essential. Successful candidate to engage both in clinical work and research under direction but previous research experience not necessary.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 10th November.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON, to become vacant on Monday, 19th November, 1956. This post is recognised for purposes of the F.R.C.S. (Eng.). Appointment will be for a period of 6 months. National Health Service salary.

Applications should reach the Secretary on or before Friday, 26th October, together with copies of 3 recent testimonials.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SENIOR HOUSE OFFICER, vacant 17th November for duty in Casualty, Orthopædic and Fracture Departments. Resident at Clayponds Wing, South Ealing, and responsible for beds there.

Applications, stating age, nationality, qualifications and experience, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 30th October.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applica-tions are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON falling vacant on 5th December, 1956. The successful candidate will be required to carry out a fortnight's locum duty starting on 21st November, 1956.

Application forms from the Physician-Superintendent. Stamped addressed envelope should be enclosed.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER. Appointment for 1 year from 1st December, 1956, and graded as Registrar.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should be sent to the undersigned not later than 29th October.

THOMAS BROWN, House Governor.
London Chest Hospital, E.2.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant immediately.

Application forms, obtainable from Physician-Superintendent, should be returned as soon as possible, with copies of not more than 3 testimonials.

NORTH LONDON BLOOD TRANSFUSION CENTRE, Deansbrook-road, EDGWARE, MIDDLESEX. Locum JUNIOR HOSPITAL MEDICAL OFFICER required until 31st March, 1957, for full-time duty with mobile teams at donor sessions. Salary £17 10s. per week.

Applications, giving age, qualifications, experience, and names of 2 referees, to Director by 27th October, 1956.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. 2 RESIDENT HOUSE PHYSICIANS (post-registration) required for 1st December, for 6 months. General medicine.

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 30th October.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the posts of :—

(a) HOUSE SURGEON (Pre-registration post) vacant 1st December, 1956. Tenable for 6 months.
(b) HOUSE PHYSICIAN (pre-registration post), vacant 1st December, 1956. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than Saturday, 3rd November, 1956.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. Applications are invited for the undermentioned posts commencing 1st December, 1956. Preference will be given to pre-registration candidates where appropriate :—

2 HOUSE SURGEONS (general surgery), pre-registration posts. Recognised for F.R.C.S.

2 HOUSE SURGEONS (obstetrics and gynæcology), 1 pre-registration post. Both recognised for M.R.C.O.G. in obstetrics.

4 HOUSE PHYSICIANS (general medicine), pre-registration posts.

Applications, stating age, qualifications, medical school, experience, together with names and addresses of 2 referees, to reach Secretary to Committee by 1st November, 1956.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. (564 Beds.) Applications are invited for the posts commencing 1st January, 1957, of SENIOR HOUSE OFFICERS (casualty), resident on duty. Recognised for F.R.C.S.

Applications, stating age, experience, qualifications, together with names and addresses of 2 referees, to be sent to Secretary to Committee by 1st November, 1956.

ROYAL FREE HOSPITAL. Applications are invited for the post of REGISTRAR to the X-ray Department of the Royal Free Hospital. The post is non-resident, for 1 year in the first instance. Duties to commence as soon as possible. Candidates should be registered medical practitioners of not more than 10 years standing and should hold the D.M.R.(D.).

Formal applications, giving details of experience, &c., together with 3 testimonials, should be sent to the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 12th November, 1956.

ROYAL MARSDEN HOSPITAL, Fulham-road, S.W.3. Applications are invited from registered medical practitioners for the 2 posts of HOUSE SURGEONS (resident). Salary £525 p.a. The posts are tenable for 6 months from 29th December, 1956, and 1st January, 1957, respectively.

Application forms are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent not later than Friday, 9th November, 1956.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women practitioners for the appointment of CLINICAL ASSISTANT (general practitioner grade) to the Consultant to the Rheumatism Clinic. 1 session per week, at present Monday evening.

Application forms from the Hospital Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Locum RESIDENT MEDICAL OFFICER (Female) Senior House Officer grade, required at the above Hospital from 1st November, 1956.

Apply to Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited for the post of SENIOR RESIDENT MEDICAL OFFICER (Woman), Senior House Officer grade. Appointment for 6 months; renewable. Duties include care of children's ward, medical beds, E.N.T. and administration. Offers suitable experience to those intending to enter General Practice. Vacant 1st November.

Application forms from the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women medical practitioners for the post of ANÆSTHETIC REGISTRAR (either resident or prepared to live within 20 minutes of the Hospital). D.A. desirable but not essential. Post recognised for D.A. The appointment is normally for 2 years, but subject to review at the end of 1 year, and will be vacant in January, 1957. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

Forms of application (enclosing stamped addressed envelope) from Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 3rd November, 1956.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women practitioners for the post of Part-time MEDICAL REGISTRAR (7 sessions weekly), vacant on 1st November, 1956. The appointment will be for 1 year in the first instance. A higher qualification in medicine is desirable. Canvassing will disqualify but candidates are not precluded from visiting the Hospital.

For forms of application apply (enclosing stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed forms should be returned not later than 10th November, 1956.

ST. GEORGE'S HOSPITAL AND THE ROYAL HAMPSHIRE COUNTY HOSPITAL, WINCHESTER. (Joint appointment.) Applications are invited for the post of SURGICAL FIRST ASSISTANT in the grade of Senior Registrar. Candidates should hold the Diploma of Fellow of the Royal College of Surgeons (England). The appointment will be for 1 year in the first instance, and the successful candidate will be required to take up duty as soon as possible after 1st December, 1956. The successful candidate will be required to serve part of the normal period as Senior Registrar in the St. George's Hospital group and part at the Royal Hampshire County Hospital, Winchester.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 3rd November, 1956.

P. H. CONSTABLE, House Governor.

St. George's Hospital, S.W.1.

ST. GEORGE'S HOSPITAL AND THE SOUTHAMPTON GROUP OF HOSPITALS. (Joint appointment.) Applications are invited for the post of SENIOR REGISTRAR to the Department of Obstetrics and Gynæcology. This is a joint appointment between the St. George's Hospital Group and the Southampton Group of hospitals. Candidates should possess a higher surgical qualification, and will be required to take up duty at St. George's Hospital as soon as possible after 1st December, 1956.

Applications, stating age, education, qualifications, experience and the names of 2 referees, should reach the undersigned not later than 10th November, 1956.

P. H. CONSTABLE, House Governor.

St. George's Hospital, S.W.1.

ST. GEORGE'S HOSPITAL AND THE SOUTHAMPTON GROUP OF HOSPITALS. (Joint appointment.) Applications are invited for the post of SENIOR REGISTRAR to the Department of Pathology. The appointment will be for 1 year in the first instance, and the successful candidate will be required to take up duty as soon as possible. The successful candidate will be required to serve the first 2 years as Senior Registrar with the Southampton Group of hospitals and the remainder of the period with the St. George's Hospital Group. The work will cover mainly morbid anatomy and hematology.

Applications, stating age, education, qualifications, experience and the names of 2 referees, should reach the undersigned not later than 10th November, 1956.

P. H. CONSTABLE, House Governor.

St. George's Hospital, S.W.1.

ST. GILES' HOSPITAL, Camberwell, S.E.5. Applications invited for appointment as HOUSE OFFICER (casualty duties, with some general surgical, E.N.T., and eye beds). Recognised pre-registration post.

Apply to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 6th November.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. Locum SURGICAL REGISTRAR required from 1st December until permanent appointment made.

Apply, with full particulars, including names of 2 referees, to Group Secretary at above address.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR. Post vacant 1st December.

Application forms (obtainable from Group Secretary, Wandsworth Hospital Group, at above address) to be completed and returned by 3rd November.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (Acute general—192 Beds.) Applications are invited from registered or provisionally registered medical practitioners for the post of HOUSE SURGEON. Post vacant immediately.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

ST. MARY'S HOSPITAL CHILDREN'S DEPARTMENT, PRINCESS LOUISE KENSINGTON HOSPITAL FOR CHILDREN, St. Quintin-avenue, W.10. HOUSE OFFICER required (second or third post), medical, vacant 1st December, 1956. Pre-registration (second post), candidates considered. Recognised for the D.C.H.

Applications to undersigned not later than Monday, 29th October, 1956. A. C. YOUNG, Secretary.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House SURGEON (obstetrics and gynæcology), second post, resident. Vacancy late November. Post recognised for D.Obst.R.C.O.G.

Applications, naming 2 referees, to be submitted to Medical Superintendent, within 14 days.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (pre-registration), resident. Vacancy late November, 1956.

Applications, naming 2 referees, to Medical Superintendent.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN for duty in Rheumatism Unit. Resident. This post offers valuable experience in general medicine and specialised experience in rheumatic and connective tissue diseases. Vacancy 17th December, 1956.

Applications, naming 2 referees, to be sent to Medical Superintendent within 14 days.

ST. THOMAS'S HOSPITAL, London, S.E.1. Temporary Whole-time SENIOR REGISTRAR to the X-ray Diagnostic Department required immediately, for a period of approximately 9 months, with possibility of permanency.

Applications, naming 2 referees, to the Clerk of the Governors, by 26th October, 1956.

THORPE COOMBE MATERNITY HOSPITAL Walthamstow, E.17. (58 Beds.) Applications are invited from medical Women for the post of JUNIOR OBSTETRIC OFFICER (graded House Officer), vacant 19th November, 1956. The Hospital is recognised by the Royal College of Obstetricians and Gynæcologists.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

WESTMINSTER CHILDREN'S HOSPITAL. Westminster HOSPITAL TEACHING GROUP. HOUSE PHYSICIAN (second pre-registration), required for 6 months from 1st December, 1956.

Applications, with copies of test monials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 3rd November, 1956.

WESTMINSTER CHILDREN'S HOSPITAL. Westminster HOSPITAL TEACHING GROUP. CASUALTY OFFICER required for 6 months from 1st January, 1957. Grade, House Officer (post-registration) or Senior House Officer, dependent on experience.

Applications, with copies of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 3rd November, 1956.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICERS (anæsthetics). 2 posts vacant early November, 1 at St. Nicholas Hospital, Plumstead, and 1 at Memorial Hospital, Woolwich. Both recognised for F.F.A.R.C.S. and D.A. 6 months resident appointments and may then be renewed.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. and Ophthalmology Departments.

Application forms from the Hospital Secretary to be returned by 29th October, 1956.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration) in the Paediatric Department.

Application forms from the Hospital Secretary to be returned by 29th October, 1956.

ASCOT. HEATHERWOOD ORTHOPÆDIC HOSPITAL. Locum ORTHOPÆDIC REGISTRAR required immediately.

Applications, with full details, to Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. (580 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for Special Departments (E.N.T., paediatric, dermatology, &c.). 6 months appointment. Not suitable for pre-registration candidates; offers good experience before general practice.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

ASHFORD HOSPITAL, Ashford, Middlesex. (580 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general surgical and medical duties. 6 months appointment, not suitable for pre-registration candidates.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON (Male) for Traumatic and Orthopædic Unit about 1st November, 1956. 6 months appointment suitable for pre-registration candidates.

Applications, stating age, qualifications and experience with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BARNSLEY. BECKETT HOSPITAL. (174 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SURGICAL REGISTRAR required. Married accommodation available. Post vacant 22nd December. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th October, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 105 Beds.) SENIOR HOUSE SURGEON post vacant from 1st January, 1957, for 1 year. Salary £745 p.a. (5-roomed furnished flat available for rental.)

Applications, with customary details, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BATLEY. THE GENERAL HOSPITAL, Carlinghow Hill, BATLEY. Applications are invited for the post of SENIOR HOUSE OFFICER (resident) which is vacant now. This Hospital deals with orthopædic, E.N.T., general and ophthalmic surgery, and the person appointed should preferably have experience and be interested in orthopædics.

Applications, together with 2 testimonials, should be forwarded to the Administrative Officer at the Hospital.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required (mainly orthopædic).* Pre- or post-registration: recognised for F.R.C.S. Vacant mid-October. Post offers exceptional opportunities for general experience in busy acute surgical units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) Resident Pre-registration HOUSE PHYSICIAN required approximately mid-November.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD (near). BROMHAM HOSPITAL. (434 Beds for mental defectives and 60 at Annexe near Sandy.) REGISTRAR in Psychiatry required (resident). Hospital may be visited by direct appointment with the Medical Superintendent (phone: Oakley 295).

Application forms obtainable from, and returnable to, Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR for duties at the Queen Elizabeth Hospital and The Birmingham and Midland Hospital for Women (Professorial Unit) to commence 1st March, 1957.

Forms of application with details of appointment may be obtained from, and should be returned not later than 30th November, 1956, to, the House Governor, Birmingham and Midland Hospitals for Women, Showell Green-lane, Birmingham, 11. G. A. PHALP, Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. RESIDENT GYNÆCOLOGICAL HOUSE SURGEON required for 7th January, 1957.

Application forms obtainable from the House Governor, to be returned 5th November, 1956.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of Locum Tenens MEDICAL REGISTRAR or SENIOR HOUSE OFFICER for the period 1st December, 1956–30th June, 1957. Preference given to applicants with M.R.C.P. Normally non-resident but residence might be available.

Application forms obtainable from the House Governor and should be returned by 3rd November, 1956.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT REGISTRAR in Anæsthetics to the United Birmingham Hospitals. The appointment is tenable for 1 year in the first instance. Preference will be given to candidates who have passed Part I, D.A., or Primary F.F.A.R.C.S.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him by 27th October, 1956.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of SURGICAL REGISTRAR (Registrar grade). This post is designed to give experience in neurosurgery and plastic surgery and would be suitable for trainees in general surgery, orthopædic and other branches of surgery. The appointment is tenable for 6 months in the first instance with the possibility of reappointment for a further period of time. The successful candidate may be required to be resident.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned to him by 27th October, 1956.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **South Warwickshire Group, 50, Holly-walk, Leamington Spa.**

REGISTRAR (anæsthetics). Recognised for F.F.A.R.C.S. Duties mainly at Warwick Hospital (320 Beds). Experience specially.

(2) **Wolverhampton Group, The Royal Hospital, Wolverhampton**

REGISTRAR (diagnostic radiology) at The Royal Hospita (associated Hospital of Birmingham University Medical School). Part I Diploma of Medical Radiology essential. Hospital recognised for Part II. Duties also at other hospitals in the Group.

Application forms from Group Secretaries to be returned by 29th October, 1956.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE SURGEON required. Appointment for 6 months, but renewable. Hospital carries resident staff of 5 and provides a 2-year course of instruction. Recognised for the D.O. (England) and F.R.C.S. (England) in Ophthalmology. Wide experience available in all branches, including surgery.

Detailed applications to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 9. YARDLEY GREEN HOSPITAL. THORACIC SURGICAL UNIT. (66 Beds.) Vacancy for SENIOR HOUSE OFFICER. No previous experience in thoracic surgery necessary.

Applications, stating age, qualifications, training, and experience, together with names of 2 referees, to be addressed to Group Secretary, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. RESIDENT MEDICAL OFFICER in Infectious Diseases (Senior House Officer grade), vacant 1st November. Hospital serves a wide area and gives opportunities for the study of infectious diseases. Part of Hospital is being developed as a General Hospital, where further experience can be gained.

Apply Physician-Superintendent, with 2 testimonials.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) HOUSE SURGEON required. Recognised for pre-registration and F.R.C.S. Unit of approximately 85 adult and children's general surgical beds under control of 2 Consultant Surgeons.

Detailed applications, with copies of 3 recent testimonials, to Group Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL (780 Beds.) SENIOR HOUSE OFFICER (Casualty Department) required (40,000 attendances per year). Resident or non-resident. Recognised for F.R.C.S. Tenable for 6 or 12 months. Vacant 18th December, 1956.

Applications, with copies of 3 recent testimonials, to Group Secretary.

BISHOP'S STORTFORD. HERTS AND ESSEX GENERAL HOSPITAL. (Formerly Haymeads Hospital.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary SURGICAL REGISTRAR to commence immediately for 1 month in first instance followed by engagement on a week-by-week basis.

Applications, giving full details, together with copies of recent testimonials, or the names of referees, to the Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN. The post which becomes vacant on 16th November, is recognised for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident) orthopædic and casualty combined. The post, which becomes vacant on 10th November, is recognised for the F.R.C.S. examination.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics). The post, which becomes vacant on 10th November, is recognised for the D.A. and F.F.A.R.C.S., and is tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HAMPSHIRE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE PHYSICIANS (pre-registration Intern) required for general medicine for posts becoming vacant on 22nd and 29th November, 1956, at the above Hospital of 259 Beds (including 79 acute medical, 34 pædiatric, 6 chest diagnostic and a geriatric unit). Duties also include attendance at outpatient clinics at the Royal Victoria Hospital, Boscombe, Bournemouth.

Applications, with copies of testimonials, to the Hospital Secretary at the Hospital.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required 1st November, 1956, for duties throughout the Group, mainly at Royal Infirmary, Blackburn. Residence at Queen's Park Hospital, Blackburn. Post recognised for D.A. and F.F.A.R.C.S.

Apply to Secretary of Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn, giving names of 2 referees.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (pathology) required for duties at Royal Infirmary, Blackburn (Group Laboratory), but may also be required for duties at Queen's Park Hospital, Blackburn and Victoria Hospital, Accrington, at Consultant's discretion. Recognised for D.Path. Post vacant 1st January or possibly before.

Applications, with names of 2 referees, to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BLACKPOOL VICTORIA HOSPITAL. (348 Beds.) HOUSE OFFICER (surgical). Surgical pre-registration post available on 1st November, at this modern well-equipped Hospital with excellent facilities for gaining experience (92 general surgical beds). Post recognised for F.R.C.S.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BOLTON. THE ROYAL INFIRMARY. (237 Beds.) RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery, vacant 29th October, tenable for 12 months and recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer grade). Main duties at Bolton District General Hospital and Bolton Royal Infirmary. Vacant 17th November, tenable for 12 months and recognised for the D.A. and F.F.A.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. (542 staffed beds—expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Regional Department of Neurosurgery. Vacant shortly. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL MENTAL HOSPITAL MANAGEMENT COM-MITTEE. BARROW AND FISHPONDS HOSPITALS. Applications invited from registered medical practitioners for appointment as SENIOR HOUSE OFFICER. Experience in general medicine or neurology an advantage. The Group includes Modern Admission Units, Neurosis Centre, and Day Hospital, with Departments of Applied Psychology and Electro-encephalography. The appointment offers opportunities for experience in many aspects of acute and chronic psychiatric illness.

Applications, giving details of experience, and names of 3 referees, should be sent to Medical Superintendent, Barrow Hospital, Barrow Gurney, near Bristol.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. SENIOR HOUSE SURGEON in Obstetrics required at Southmead Hospital, Bristol (571 Beds including 133 maternity). The person appointed will be attached to the Professorial Unit. The post will be tenable for 6 months.

Applications to be made to the Group Secretary, Southmead Hospital, Bristol.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (#23 Beds.) HOUSE OFFICER in Obstetrics and Gynæcology (pre-registration) required. 33 maternity, 18 gynæcological beds. Post vacant November. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Applications, with the names of 3 referees, to the Hospital Secretary.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road, BRIGHTON. Vacancy for HOUSE PHYSICIAN (Female) for 6 months commencing 1st December, 1956. Includes duties in Gynæcological Department. Open to pre-registration candidates.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 testimonials and/or names of referees, to be sent to the Administrative Officer as soon as possible.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. A full-time Locum REGISTRAR in Orthopædic Surgery required immediately until approximately the end of November, 1956 (preferably resident).

Applications, stating age, qualifications, experience, &c., with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Brighton.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) 2 HOUSE SURGEONS required mid- and end-October. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BURNLEY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). The post offers good all-round experience under Consultant staff and recognised for the Diploma in Anæsthetics. Resident accommodation is available.

Applications, with 2 references, to the Group Secretary, Burnley General Hospital.

CAMBRIDGE. MATERNITY HOSPITAL. Senior House OFFICER (resident), vacant 10th December for 6 months in first instance with possible extension to 1 year. Some previous obstetrical experience essential. Recognised obstetrical appointment for M.R.C.O.G. and D.Obst.R.C.O.G.

Apply, stating age, nationality, qualifications, and experience with dates, and copies of 3 testimonials, to Secretary, United Cambridge Hospitals, Addenbrooke's Hospital, Cambridge, by 3rd November. Interviews mid-November.

CARSHALTON. QUEEN MARY'S HOSPITAL FOR CHILDREN. (853 Beds.) ORTHOPÆDIC REGISTRAR, with some surgical duties, required. Applicants are invited to visit the Hospital by appointment with the Physician-Superintendent.

Applications, which should be made on forms obtainable from the Group Secretary, should be returned immediately.

CHELMSFORD. ST. JOHN'S HOSPITAL. House Sur-GEON (pre-registration, first or second post). Duties commence 16th November, 1956. The Hospital deals with a large number of routine and emergency cases. The post is recognised for training for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 30th October, 1956, by the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required from 3rd November, 1956. 100 orthopædic beds. Senior House Officer or House Officer (intern grade). Post recognised for F.R.C.S. and Pre-registration Service. Preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (430 Beds.) ANÆSTHETIC REGISTRAR required from end October. Post recognised for F.F.A.R.C.S. and D.A. Hospital may be visited by arrangement with Physician-Superintendent (Tel. : Ottershaw 441).

Application forms from Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Chertsey, Surrey. Closing date 29th October.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT REGISTRAR in Anæsthetics. The appointment for 1 year (renewable) will be vacant January, 1957. Duties chiefly at the Royal West Sussex and St. Richard's Hospitals. Recognised for F.F.A.R.C.S. Salary (Whitley terms and conditions) £850 first, £965 second year, less £170 p.a. for residence. National Health Service superannuation scheme. Hospitals may be visited by appointment.

Application forms, from Group Secretary, 174, Broyle-road, Chichester, to be returned by 7th November.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second or third posts. Post approved for pre-registration practitioners. Also recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant 29th October, 1956.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE PHYSICIAN required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. 7 residents including Resident Medical Officer and House Physician. Vacant 12th November, 1956.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

COLCHESTER. ESSEX COUNTY HOSPITAL. (188 Beds.) Applications invited for post of SENIOR HOUSE OFFICER to Casualty and Radiotherapy Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CHESTERFIELD. SCARSDALE HOSPITAL. Senior HOUSE OFFICER for obstetrics and gynæcology required 28th October at above Hospital (with Maternity Unit of 72 Beds). Post recognised for M.R.C.O.G. and D.Obst.R.C.O.G. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee, at Chesterfield Royal Hospital.

CHESTERFIELD ROYAL HOSPITAL. Senior House OFFICER required immediately at above Hospital for Accident and Orthopædic Department. Post recognised for F.R.C.S. training and offers valuable experience. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. (281 Beds.) RESIDENT HOUSE SURGEON required 28th October. Pre-registration post, recognised for F.R.C.S.

Apply Group Secretary.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required pre- or post-registration. The post offers a wide experience in general surgery, gynæcology, and orthopædic surgery. Post recognised for the F.R.C.S.

Apply Secretary, General Hospital, Cheltenham.

CREWE AND DISTRICT MEMORIAL HOSPITAL. REGISTRAR (Casualty and Orthopædic Department) required. Duties include casualty work at the Hospital, as well as orthopædics. Modern Theatres and Casualty Department almost ready for occupation. Salary and conditions as per regulations.

Applications, stating age, qualifications, and experience, together with names of 3 referees, to Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) required from 5th December, 1956.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

DENBIGH. THE NORTH WALES HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER required. A house on the Hospital estate or single quarters available. The Hospital has modern treatment facilities, and is recognised by the Conjoint Board for the purpose of their D.P.M. examination.

Applications, with names of 2 referees, to the Medical Superintendent.

S. L. FROST, Secretary to the Management Committee.

DORCHESTER. DORSET COUNTY HOSPITAL. OBSTETRICAL AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female. Post vacant early January, 1957. Post tenable for 6 months and recognised for D.Obst. R.C.O.G.

Applications, stating age, experience, qualifications, and nationality, together with copies of testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

DOUGLAS, ISLE OF MAN. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited from registered medical practitioners with previous hospital experience, preferably at a teaching hospital, for the post of SENIOR HOUSE SURGEON at this busy General Hospital. The Senior of 4 House Officer posts. The post becomes vacant mid-November, and is suitable for candidate seeking further clinical experience and opportunity for reading for higher qualification. Recognised for F.R.C.S. Salary £745 p.a. with a deduction of £125 p.a. for board, lodging, &c., if resident.

Applications, giving relevant particulars, and copies of 2 recent testimonials, or names and addresses of 2 referees, should be forwarded to the Secretary, Noble's Isle of Man Hospital, Douglas.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Applications are invited for the post of HOUSE SURGEON. Approved as pre-registration post and recognised for F.R.C.S.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DRIFFIELD, YORKSHIRE. NORTHFIELD SANATORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches of tuberculosis within Group, including surgery, M.M.R., and clinics. Time for study. Ex-patients welcome. £150 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Post now vacant.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (surgical). Post vacant October, 1956.

Apply, Group Secretary, Guest Hospital, Dudley.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) SENIOR MEDICAL REGISTRAR, United Norwich Hospitals. Main hospital Norfolk and Norwich Hospital (441 Beds). The successful candidate will be seconded to St. Bartholomew's Hospital, London, for the fourth year of the appointment. Higher qualification necessary. Candidates invited to visit Hospital by direct arrangement with the Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

(2) ORTHOPÆDIC REGISTRAR, Ipswich and East Suffolk Hospital. Post provides excellent training in orthopædic surgery. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

(3) MEDICAL REGISTRAR, Papworth Hospital, Cambridgeshire. Post provides good experience in tuberculosis and other chest diseases. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Physician-Superintendent.

Applications, stating age, experience, and the names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 29th October, 1956.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. 2 RESIDENT HOUSE PHYSICIANS for above Hospital. Posts vacant 29th November, 1956, and 6th December, 1956. 6 months appointments. Posts recognised for pre-registration purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 27th October, 1956.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE SURGEON (general and genito-urinary surgery) for above Hospital. Post vacant 29th November, 1956. 6 months appointment. Recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 3rd November, 1956.

EPPING. ST. MARGARET'S HOSPITAL. Epping Group HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædic) as Orthopædic House Surgeon and Casualty Officer. Recognised training post for F.R.C.S. Busy General Hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 26th October.

EPPING. ST. MARGARET'S HOSPITAL. Epping GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for Chest Department and to act as Second Resident Anæsthetist. Good opportunity for experience in modern methods. Previous experience in chest diseases desirable but not essential.

Applications, with references, to reach Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 26th October.

ENFIELD, MIDDLESEX. WAR MEMORIAL HOSPITAL, CHASE SIDE. RESIDENT SENIOR HOUSE OFFICER required for general medical and surgical duties in this Acute General Hospital of 61 Beds. Vacant now. 12 months appointment. Deduction of £150 p.a. for residential emoluments.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Appointment of RESIDENT HOUSE SURGEON (third post), vacant 30th December, 1956. Post provides experience and duties in both general surgery and orthopædics. 6 months appointment. Post recognised for F.R.C.S. by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

EPSOM GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for Whole-time REGISTRAR in Chest Medicine to the Epsom and Dorking Chest Clinics, vacancy 1st December, 1956. Duties will include sessions at 1 or both clinics. Additionally person appointed will be Registrar at Cheam Sanatorium, where there are 53 Beds for the treatment of cases of pulmonary tuberculosis, and will have the day-to-day care of patients under the various Consultants concerned. Successful candidate will be required to live within easy access of Cheam Sanatorium. Applicants may visit Units by arrangement with Consultant Chest Physician.

Application forms may be obtained from Group Secretary, Epsom District Hospital, Dorking-road, Epsom (send stamped addressed foolscap envelope), for completion and return within 14 days.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE PHYSICIAN required 6th December. Pre-registration post.

Applications, stating age, qualifications, and experience with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 11th December. Pre-registration post, recognised for F.R.C.S.

Applications, stating age, qualifications, and experience with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from pre-registration and registered medical practitioners for the appointment of HOUSE SURGEON (obstetrics and gynæcology) vacant 7th December, 1956. This post is recognised for the M.R.C.O.G. examination (Gynæcology only).

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 27th October, 1956.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from pre-registration and registered medical practitioners for the appointment of HOUSE SURGEON (general surgery) vacant 6th December, 1956.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 27th October, 1956.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical (Locum)) now vacant until the end of January, 1957. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. (167 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. (New post.)

Applications, stating full details and giving 2 names for reference, should be sent to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE PHYSICIAN (pre-registration) required.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of HOUSE SURGEON (general surgery and orthopædics), vacant early November.

Applications by 31st October to Hospital Administrator.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Applications are invited for RESIDENT CASUALTY OFFICER for duty with Accident Service, with care of traumatic and orthopædic inpatients. The post is recognised for F.R.C.S., and becomes vacant on 1st November, 1956. Salary £745–£1075 according to experience.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to Medical Administrator as soon as possible.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 3rd November, 1956. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HOUSE SURGEON required to commence duties on 14th November. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
Huddersfield Hospital Management Committee,
The Royal Infirmary, Huddersfield.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The post offers excellent experience and opportunity for working for higher qualifications.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon, vacant on 7th November, 1956. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, vacant on 19th November, 1956. Approved pre-registration post.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to reach the Hospital Secretary by 5th November, 1956.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING, IPSWICH. (274 Beds.) Applications invited for 2 posts of HOUSE SURGEON (pre-registration) to General Surgeons. Posts become vacant 13th and 22nd November, 1956. Recognised for R.C.S. examinations.

Applications, with full details and copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING, IPSWICH. (274 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration), vacant on 16th November, 1956.

Applications, giving details of qualifications, age, nationality, &c., together with copies of 3 recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, Heath ROAD WING, IPSWICH. (274 Beds.) Applications invited for post of CASUALTY OFFICER (Senior House Officer grade), now vacant. The post, which is normally of 1 years duration, has day-time duties only, offering opportunity of study for higher examinations.

Detailed applications, together with 3 recent testimonials, to the Hospital Secretary.

IPSWICH GROUP CHEST HOSPITALS. Senior House OFFICER for duties in the above Hospitals. Suitable for a doctor reading for higher qualifications with special interest in chest complaints. Will be required to reside alternately at Foxhall Hospital, Ipswich (102 Beds) for investigation and treatment of all chest diseases, where duties in the Major Surgical Unit will be involved, and Nayland (British Legion) Hospital, near Colchester (124 Beds for tuberculous and non-tuberculous pulmonary disease). Furnished quarters available.

Further details from Dr. G. R. MCNAB, Physician-Superintendent, Foxhall Hospital, Ipswich, to whom applications, with recent testimonials, should be sent.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. (1130 Beds.) REGISTRAR in Pathology, whole-time (resident or non-resident), vacant January, 1957. General laboratory and emergency duties with training in all branches. Previous experience desirable. Candidates may visit Hospital by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 31st October, 1956.

KETTERING GENERAL HOSPITAL, Kettering. (170 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in Anæsthetics. Post recognised for D.A.

Applications, giving details of qualifications and experience, and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering and District Hospital Management Committee, at the above address.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) HOUSE PHYSICIAN (pre-registration). Post vacant 23rd November.

Applications, with 2 recent testimonials, to be sent to Hospital Secretary.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

(i) Huddersfield Group (approximately 225 Beds in the surgical specialties). Non-resident.

(ii) Mainly at Harrogate General Hospital (approximately 150 Beds in surgical specialties). Preferably resident. Recognised for the F.F.A.R.C.S.

Infectious Diseases

Castle Hill Hospital, Cottingham (167 infectious diseases beds). Resident.

General Surgery

Halifax Group. 1 of 3 similar posts. Duties divided approximately between general and orthopædic surgery (195 general surgical and 85 orthopædic beds). May include some duties in the Casualty Department. Preferably resident.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 25th October, 1956.

LICHFIELD (near). ST. MATTHEW'S HOSPITAL, BURNTWOOD, LICHFIELD. (1350 mental beds.) BURTON-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required. Resident accommodation available. Facilities for taking a D.P.M. Course at Birmingham University.

Applications, with names of 2 referees, to Medical Superintendent.

LINCOLN. LAWN HOSPITAL, Union-road. (Mental Hospital for Private Patients—100 Beds.) LINCOLN NO. 2 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required to commence duties at beginning of January, 1957. All modern treatments used at this active Hospital. Pleasant flat available.

Apply to the Medical Superintendent with copies of 3 testimonials.

LINCOLN COUNTY HOSPITAL. (200 Beds.) **Sheffield** REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (pædiatrics) required. Duties include care of newborn and premature babies, exchange transfusions, neonatal surgery and duties at a maternity unit. This post offers excellent opportunity for the study of metabolic diseases in childhood and infancy. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th October, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LIVERPOOL, 20. BOOTLE HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN (general medicine) which will be vacant from 1st November, 1956. The post is recognised for Pre-registration Service.

Apply to Secretary, Walton Hospital, Liverpool, 9.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ROYAL LIVERPOOL CHILDREN'S HOSPITAL. Applications are invited for a resident post of SENIOR HOUSE OFFICER in General Pædiatrics and Cardiology for the period to 30th September, 1957.

Apply by 31st October, 1956, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties vacant immediately. The post is recognised by the Royal College of Surgeons for the Final F.R.C.S. examination and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the Manchester University for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary, Withington Hospital, within 7 days of the appearance of this advertisement.

MANCHESTER REGIONAL HOSPITAL BOARD. ResiDENT SURGICAL REGISTRAR required in the Blackburn and District Group with duties mainly at Queen's Park Hospital, Blackburn (640 mainly general beds). Post recognised for F.R.C.S.

Application forms obtainable from the Secretary to the Committee, Royal Infirmary, Blackburn, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of REGISTRAR in Radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester. Candidates must hold either the Diploma in Radiotherapy or an F.R.C.S. or M.R.C.P. If the latter they would be eligible for Diploma in Radiotherapy Course commencing in April, 1957.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER (general surgery) required. Post vacant end-November.

Application forms from Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the following posts :—

SENIOR HOUSE OFFICER.
HOUSE OFFICER (pre-registration surgical post).

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.
Manchester Royal Eye Hospital.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of REGISTRAR in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health). The post is full time and resident and vacant 1st January, 1957. It is preferable but not essential that candidates should hold a higher qualification. Previous experience in pædiatrics essential. The post is tenable for 12 months and the salary is in accordance with the national scale.

Application forms may be obtained from the undersigned and should be completed and returned by 29th October, 1956.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MARKET DRAYTON (near), SHROPSHIRE. CHESHIRE JOINT SANATORIUM. (305 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer according to experience). The post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

NEWCASTLE GENERAL HOSPITAL, Westgate-road, NEWCASTLE UPON TYNE, 4. NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required in the Orthopædic Department.

Applications should be sent, together with names of 2 referees, to the Secretary.

NEWCASTLE REGIONAL HOSPITAL BOARD. West CUMBERLAND GROUP OF HOSPITALS. REGISTRAR in Obstetrics and Gynæcology (resident or non-resident) to be based on Whitehaven Hospital with duties also at Workington Infirmary (obstetric beds 39, gynæcology beds 24). Appointment is for 12 months in the first instance.

Applications, with names of 3 referees, should be sent to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. East CUMBERLAND GROUP OF HOSPITALS. REGISTRAR in Obstetrics and Gynæcology (resident or non-resident). Main duties at City General Hospital and Cumberland Infirmary, Carlisle (40 gynæcology beds) also City Maternity Hospital, Carlisle (70 Beds). Appointment is for 12 months in the first instance and will be vacant on 1st January, 1957.

Applications, with names of 3 referees, to the Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, by 30th November 1956.

NEWCASTLE REGIONAL HOSPITAL BOARD.

St. George's Hospital, Morpeth (1250 Beds)

SENIOR REGISTRAR PSYCHIATRIST (whole-time), resident. Candidates should normally have previous experience in psychiatry, but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine and intend to obtain a D.P.M. and specialise in psychiatry. A small 3-roomed, furnished or unfurnished, flat is available. Appointment for 1 year initially and subject to annual review up to 4 years duration. Further particulars from Medical Superintendent.

Cherry Knowle Hospital, Ryhope, near Sunderland (860 Beds)

REGISTRAR PSYCHIATRIST (whole-time), resident or non-resident. Small flat available.

Winterton Hospital Sedgefield (2040 Beds)

REGISTRAR PSYCHIATRIST (whole-time), resident.

Arrangements can be made for the appointees to take the necessary courses of study for the University of Durham D.P.M.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 21 days.

NEWMACHAR, ABERDEENSHIRE. KINGSEAT HOSPITAL. Applications are invited from Male or Female doctors for posts as REGISTRARS and SENIOR HOUSE OFFICERS in the above modern Mental Hospital of 820 Beds. 2 posts are available in each grade and residential accommodation is available if required. The Hospital is recognised for study for the D.P.M. and there is close association with the University Department of Mental Health. Posts would be tenable for 1 year in the first instance and National Health Service conditions apply. Until these appointments are filled applications for locum tenens posts will be considered.

Applications, with age, full details of experience, &c., and the names of 2 referees, should be lodged with the Secretary, Aberdeen Mental Hospitals, 62, Queen's-road, Aberdeen, within 14 days of this advertisement.

NEWPORT, I. W. ST. MARY'S HOSPITAL. (345 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required as Casualty Officer and House Officer to Consultant Obstetrician and Gynæcologist, vacant November. Salary £745, less residential charge. Modern flat available for married candidate. Post recognised for F.R.C.S.

Applications, with names of 2 referees, to Hospital Secretary immediately.

NEWTON ABBOT HOSPITAL. (General Section—65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required early December, 1956. Married quarters available.

Applications (quoting ref. F.364/37), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Duties will include work in the Casualty Department. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th October, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required SENIOR HOUSE OFFICER, duties to commence on 1st November, 1956. Salary and conditions of service in accordance with Ministry regulations. A furnished flat is available for married candidates, if required.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Anæsthetics (non-resident) West Middlesex Hospital and neighbouring hospitals. Regional training scheme includes facilities for gaining experience in specialised techniques at Regional Thoracic Surgical and Neuro-surgical Centres. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 26th October, 1956.

NORTHAMPTON. ST. CRISPIN HOSPITAL, Duston, NORTHAMPTON. (1200 Beds.) SENIOR HOUSE OFFICER required. Salary according to national scale (£745 p.a.). Accommodation is available at the Hospital. The Hospital is approved for training for the D.P.M. of the Conjoint Board and the post offers excellent opportunities for participation in inpatient and outpatient work, E.E.G. investigations, and child psychiatry. There is a modern Admission Unit and an annual admission-rate of over 700 patients. Regular case conferences are held.

Applications, giving full details and names of 3 referees, to be sent to the Physician-Superintendent at the Hospital within 14 days.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time) in Psychiatry at Fair Mile (Mental) Hospital, near Wallingford (Berks), and Associated Clinics. Recognised for the D.P.M., and full facilities for training are available in the Area Department. The appointment will be for 1 year and eligible for extension to a second year. Single accommodation available. Married accommodation available shortly.

Application forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 26th October, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for 2 posts of RESIDENT JUNIOR PATHOLOGISTS for 6 months: 1 at the Churchill Hospital and 1 at the Radcliffe Infirmary, Oxford. The posts are graded at Senior House Officer rate, £745 p.a., and are vacant on 1st December.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 31st October.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of REGISTRAR/RESEARCH ASSISTANT to the Accident Service of the Radcliffe Infirmary, from 1st January, 1957. The duties of this post will be divided equally between the clinical duties of the Registrar appointment, and research work in the Department, under the supervision of the Director of the Accident Service.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 10th November, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of HOUSE SURGEON in the Accident Service of the Radcliffe Infirmary, to commence on 1st December for 6 months.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrative Assistant, Radcliffe Infirmary, Oxford, should be received not later than 3rd November, 1956.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON. Recognised for the F.R.C.S. Vacant now.

Queen Alexandra Hospital (87 surgical beds)

HOUSE SURGEON (pre-registration post), vacant 20th November, 1956.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PLYMOUTH. THE SCOTT ISOLATION HOSPITAL. HOUSE PHYSICIAN (resident, Male), pre-registration, post vacant 20th November, 1956. Excellent experience, particularly for those entering General Practice.

Applications should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth, Devon.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Surgery, vacant 15th November, 1956. Recognised for the F.R.C.S. Devonport Section.

HOUSE SURGEON (pre-registration post), vacant 1st January, 1957. Recognised for the F.R.C.S. Freedom Fields Section.

HOUSE PHYSICIANS (pre-registration posts), vacancies 1st and 17th January, 1957. Greenbank Road Section.

HOUSE SURGEONS (pre-registration posts), vacancies 1st December, 1956, 10th and 18th January, 1957. Recognised for the F.R.C.S. Greenbank Road Section.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group,
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. CENTRAL CASUALTY DEPARTMENT. SENIOR HOUSE OFFICERS in Casualty, 2 vacancies on 1st January, 1957. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant mid-December. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AREA HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER (pathology). Previous experience in pathology desirable, but not essential. Salary £745, less £150 board-residence.

Apply, stating age, qualifications with dates, nationality, present post, together with the names of 3 referees, to Group Secretary, 3, Craven-road, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (orthopædic) in the Area Accident and Orthopædic Department. Post now vacant. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £150 board-residence.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. Applications are invited from registered medical practitioners only for the post of RESIDENT ASSISTANT PATHOLOGIST vacant 6th December and tenable for 6 months. Salary £525 p.a.

Write, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (339 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant 1st January, 1957, for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £150 for board-residence.

Write, stating age, qualifications with dates, nationality and present post, together with the names of 3 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

RICHMOND, SURREY. CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS. (GROUP 51.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Psychotherapy. Candidates must be Psychiatrists with special interest in psychoanalysis and experience in psychotherapy. Candidates may visit the Hospital by appointment.

Application forms may be obtained from the undersigned and should be returned to the Secretary within 14 days of the appearance of this advertisement.

D. MALLION, Secretary,
Cassel Hospital Management Committee.
Ham Common, Richmond, Surrey.

RICHMOND, SURREY. ROYAL HOSPITAL. (General Hospital—121 Beds.) Applications are invited for the following posts :—

Pre-registration HOUSE PHYSICIAN. Post vacant 19th November, 1956.
Pre-registration HOUSE SURGEON. Post vacant 4th December, 1956.

Applications immediately to Administrative Officer.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BIRCH HILL HOSPITAL. Pre-registration HOUSE OFFICER (obstetrics and gynæcology) required. Recognised for the D.Obst.R.C.O.G.

Apply to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (622 Beds.) SENIOR HOUSE OFFICER required for Geriatric and Psychiatric Units at the above Hospital. Post vacant mid-November. A wide range of facilities are available at the Hospital for the investigation, treatment, and rehabilitation of acute and chronic cases. Possibility of accommodation for married applicant becoming available.

Applications, stating age, &c., to be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) SENIOR HOUSE OFFICER (Male or Female) required from 14th November, 1956. Duties include work in general medicine and in the Regional Poliomyelitis Unit (30 Beds), where excellent experience of modern methods can be obtained. Resident post.

Applications to Medical Superintendent.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required immediately. Post not approved for pre-registration purposes.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SOUTHAMPTON GENERAL HOSPITAL. (472 Beds.) RESIDENT HOUSE SURGEON required mid-November. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (472 Beds. Recognised for the Membership and Diploma examinations of the R.C.O.G.) RESIDENT HOUSE SURGEON (pre-registration) to the Gynæcological and Obstetric United required during November.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (274 Beds) and SOUTHAMPTON GENERAL HOSPITAL (472 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work. The Group includes a diagnostic and distributing Hearing Aid Centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) RESIDENT HOUSE SURGEON required mid-November. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON CHEST HOSPITAL. South West METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR SURGICAL REGISTRAR (Dominions status) required for Thoracic Unit (80 surgical beds) at above Hospital. Candidates should possess higher qualifications and should have had previous experience of thoracic surgery. This post will be for a maximum of 2 years and is intended for candidates from overseas (particularly from the Commonwealth), who are already of Senior Registrar status who wish to undertake a period of final training here before returning to their own country. The Hospital may be visited, if desired, by prior arrangement.

Application forms, obtainable from the undersigned, should be returned by 3rd November, 1956.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts :—

(*a*) REGISTRAR or SENIOR HOUSE OFFICER in Clinical Pathology. Grade according to qualifications and experience. The successful candidate may be required to work in any of the laboratories of The United Sheffield Hospitals.

Closing date for applications 27th October, 1956.

(*b*) SURGICAL REGISTRAR. Post vacant 17th January, 1957. The successful candidate will work on a rotation basis between the Royal Infirmary and the Children's Hospital. It is intended, if possible, that the holder of the post will spend equal periods in the Orthopædic Department and on each of 2 surgical firms at the Royal Infirmary ; and for a period at the Children's Hospital.

Closing date for applications 3rd November, 1956.

Applications for the above posts should state age, qualifications, and experience, give the names of 3 referees, and be sent to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SOUTH ELMSALL. WARDE-ALDAM HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade). Warde-Aldam Hospital is a general hospital of 39 Beds (general and orthopædic surgery and E.N.T.). Furnished flat available. The appointment is of attraction to Surgeons reading for Fellowship.

Applications, giving details of qualifications and previous experience, with names of 2 referees, to be forwarded to the undersigned as soon as possible.

D. G. DAVIES, Group Secretary.
Great Northern House, Salter-row, Pontefract, Yorks.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of HOUSE SURGEON (pre-registration post).

Applications, with names of 2 referees, to Secretary.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Anæsthetics, PERTH AREA. Applications are invited for the post of REGISTRAR in Anæsthetics in the Perth Area based on Perth Royal Infirmary (272 Beds) and Bridge of Earn Hospital (806 Beds). Living-in accommodation available at Bridge of Earn Hospital. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, "Bracknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 3rd November, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Surgery to the Edinburgh Southern Group of hospitals, his or her main duties being in the Bruntsfield and Longmore Hospitals.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 3rd November, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Medicine, with special duties in cardiology, at the Royal Infirmary of Edinburgh.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 3rd November, 1956.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in Surgery based at Stobhill General Hospital, Glasgow.

REGISTRAR in Surgery based at the Royal Infirmary, Greenock.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 3rd November, 1956.

STAINES HOSPITAL. North West Metropolitan Regional HOSPITAL BOARD. GYNÆCOLOGICAL REGISTRAR (resident), required at above Hospital. Unit has 32 Beds.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, London-road, Ashford, Middlesex, by 30th October, 1956. Hospital may be visited by direct appointment with the Medical Director of Ashford Hospital.

STARCROSS, DEVON. ROYAL WESTERN COUNTIES INSTITUTION HOSPITAL GROUP. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female), preferably with some knowledge of mental deficiency.

Applications, with full details of age, qualifications, and experience, together with names of 2 referees, should be submitted to the Medical Superintendent, Royal Western Counties Institution, Starcross, Devon.

STOCKTON-ON-TEES. THE CHILDREN'S HOSPITAL, Durham-road. (84 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER. The appropriate salary and conditions of service being in accordance with the Ministry of Health regulations.

Applications, with copies of 2 recent testimonials, should be forwarded to the undersigned at West Lane Hospital, Middlesbrough, as early as possible.

L. BRITTAIN, Group Secretary,
Cleveland Hospital Management Committee.

STOKE-ON-TRENT. BUCKNALL HOSPITAL. (58 infectious, 20 pneumoconiosis, 124 chronic sick beds.) Applications invited for post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER. Married accommodation available. The person appointed will be associated with all 3 departments of the Hospital and will be required to assist at the pneumoconiosis clinic.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. Applications invited for HOUSE OFFICER (medical), vacant mid-October. Recognised pre-registration post.

Detailed applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT GROUP. Locum SENIOR HOUSE OFFICER (obstetrics and gynæcology) required for above Hospital. (100 maternity, 40 gynæcology beds.) Period 1st–28th November.

Apply Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for general surgical team. Recognised for F.R.C.S. Post vacant 2nd November and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, HertfordSHIRE. (384 Beds.) Locum Tenens ANÆSTHETIC REGISTRAR (resident), required for any period of 2 weeks between now and end of November.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR required. Post vacant 11th January, 1957. Preference given to candidates having considerable experience in dealing with medical emergencies. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts, by 29th October, 1956.

ST. ALBANS, HERTFORDSHIRE. NAPSBURY MENTAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER, appointment to commence immediately. Previous experience as House Physician or House Surgeon essential. Previous psychiatric experience desirable but not essential. Regular clinical case conferences, good psychiatric library and other training facilities. Salary £745 p.a. Residential accommodation is available, if required for which a charge will be made. No married quarters.

Applications, with reference or testimonials, to be sent not later than 30th October, 1956, to the Medical Superintendent (Telephone : Bowmansgreen 2181).

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER in the Senior House Officer grade, at St. Helens Hospital (196 Beds). The post is approved for the 6 months training in casualty work required of candidates for the Fellowship examination of the Royal College of Surgeons.

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded immediately to N. RICHARDS, Group Secretary.

Whiston Hospital, Prescot.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 2nd December. Preference given to persons seeking pre-registration post.

Applications, stating age, experience and qualifications with dates, together with copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. Senior HOUSE OFFICER (medical) with some pathological duties. Post now vacant.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

WARWICK (near). CENTRAL MENTAL HOSPITAL. (1400 Beds.) SENIOR HOUSE OFFICER (Neurosis Unit). Adult and child psychiatry clinics, Departments of Electroencephalography, Occupational Therapy, Psychology and Social Work. Recognised for D.P.M. House available.

Applications, with names and addresses of 3 referees, to Medical Superintendent within 14 days.

WELWYN GARDEN CITY MATERNITY HOSPITAL AND ST. ALBANS CITY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time GYNÆCOLOGICAL AND OBSTETRIC REGISTRAR required for duties mainly at Welwyn Garden City Maternity Hospital (30 Beds). It is hoped to provide suitable accommodation within easy reach of the Hospital for a single or married candidate. Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts, by 6th November, 1956.

WILLERBY, EAST YORKSHIRE (near HULL). DE LA POLE HOSPITAL. (1174 Beds—mental illness and nervous disorders.)

(*a*) JUNIOR HOSPITAL MEDICAL OFFICER. The successful candidate will be engaged on work in the admission wards to a considerable extent and for duties at a Psychiatric Day Clinic to be opened shortly.

(*b*) JUNIOR HOSPITAL MEDICAL OFFICER. This is a newly established post which is intended to give the successful candidate a good indication of Mental Hospital Practices.

Hospital has admission-rate of over 850 annually. Modern reception hospital, villas and neurosis unit. All modern methods of treatment practised. If desired facilities for attending the Leeds University will be provided if studying for the D.P.M.

Application forms from Group Secretary, Hull B Hospital Management Committee, at the above address.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (313 Beds.) HOUSE OFFICER (anæsthetics). Post vacant 10th November. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR GROUP OF HOSPITALS. Plastic Surgical REGISTRAR required. Either resident (at Canadian Red Cross Memorial Hospital) or non-resident. Successful candidate will also be expected to attend the main Plastic Centre at Mount Vernon Hospital, Northwood. Duties will include the care of all plastic surgical cases, related accident cases and hand injuries.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 4th November.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery, required. Male or Female, for post vacant 19th December. Recognised for F.R.C.S. Preference given to persons seeking pre-registration post. Applicants required to be members of Medical Protection Society.

Applications, stating age, qualifications with dates, nationality, with copies of recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN required, Male or Female, for post vacant 15th December. Preference given to persons seeking pre-registration post. Applicants required to be members of Medical Protection Society.

Applications, stating age, qualifications with dates, nationality and copies of 3 recent testimonials, to Secretary.

WINDYGATES, FIFESHIRE. CAMERON I.D. HOSPITAL. HOUSE OFFICER required for Chest Unit of 30 Beds to work under Chest Physician for diseases of the chest. Salary in accordance with national scale.

Apply, with copies of 2 recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (Associated Hospital of Birmingham University Medical School.) SENIOR HOUSE OFFICER (thoracic surgery and thoracic medicine). New post for duties in thoracic surgical ward opening shortly and the Chest Clinic, Wolverhampton. Vacant 1st December. Good basic experience.

Applications to Hospital Secretary.

WOLVERHAMPTON GROUP. The Royal Hospital, WOLVERHAMPTON. REGISTRAR in Orthopædic and Traumatic Surgery. All types of traumatic and orthopædic conditions. Industrial accident work and rehabilitation at special unit of 60 Beds.

Applications, giving full particulars of age, qualifications, and experience, by 2nd November, to Group Secretary, The Royal Hospital, Wolverhampton.

WORCESTER ROYAL INFIRMARY. (213 Beds.) House SURGEON (pre-registration or otherwise) required middle November.

Applications to the Secretary.

WORCESTER ROYAL INFIRMARY. Paediatric House PHYSICIAN required. Hospital recognised for D.C.H.
Applications to Secretary.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required 1st November, 1956, for the above Hospital. The appointment is recognised for F.R.C.S. examinations. An unfurnished flat is available for a married man.
Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

YEOVIL HOSPITAL, Somerset. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical). Yeovil is the main general hospital of a Group and affords good all-round practical experience. Salary £745 p.a.
Applications, giving age, experience, qualifications, nationality, and names of 3 referees, to be sent to the Group Secretary, South Somerset Hospital Management Committee, 71, Higher-kingston, Yeovil.

YORK. NABURN AND BOOTHAM PARK HOSPITAL. YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. A vacancy exists for a JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry at this Hospital of 630 Beds with an annual admission-rate of over 550 (including Health Service, amenity and private categories). Preference will be given to applicants who wish to study for the D.P.M. and facilities for attending the appropriate courses at the University of Leeds are readily available. The Hospital has 2 branches, both undergoing structural and functional alterations and forming an integral part of the York Comprehensive Mental Health Service. The post may be resident or non-resident.
The Hospital may be seen by appointment with the Physician-Superintendent, Bootham Park, York, to whom applications should be addressed with details of career and the names of 3 referees.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in General Surgery at hospitals managed by the Fermanagh Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.
Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 3rd November, 1956.

Public Appointments

ACCRA MUNICIPAL COUNCIL, Gold Coast. Medical OFFICER OF HEALTH required either (*a*) on probation for pensionable employment on salary scale (including overseas pay) £1055, rising to £1850 a year, or (*b*) on temporary terms on salary scale (including overseas pay) £1330, rising to £2310 a year plus gratuity at rate £150 a year. Commencing salary according to qualifications and experience. Outfit allowance £30–£60 according to salary. Free passages. Liberal leave on full salary. Candidates must possess qualifications registrable in U.K. and D.P.H. or similar qualification. D.T.M. & H. and experience in public health work and clinical medicine, preferably in tropics, an advantage. Superannuation rights can be preserved in certain cases.
Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience, and quote M3/43687/LD.

BARROW-IN-FURNESS. COUNTY BOROUGH OF BARROW-IN-FURNESS. Applications are invited from registered medical practitioners holding the Diploma in Public Health or similar qualifications for the appointment of MEDICAL OFFICER OF HEALTH for the County Borough. The salary scale will be £1740–£55–£1960 p.a. in accordance with the recommendations of Medical Council Committee C of the Whitley Councils for the Health Services (Great Britain).
Form of application and conditions of appointment may be obtained from the undersigned, to whom applications in envelopes endorsed "Medical Officer of Health" should be sent, to be received not later than NOON on Wednesday, 31st October, 1956. LAWRENCE ALLEN, Town Clerk.
Town Hall, Barrow-in-Furness, September, 1956.

FACTORY DOCTORS, Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
BELLSHILL ..	LANARK ..	3RD NOVEMBER, 1956

MANCHESTER EDUCATION COMMITTEE. Required, part-time PSYCHIATRIST at the Child Guidance Clinic, to work 5 sessions (or less) per week. Candidates should hold D.P.M. and have recognised training in child psychiatry. Salary £4 4s. per session.
Application form and further particulars from Chief Education Officer, P.O. Box 480, Manchester, 3, returnable by 10th November.

GOVERNMENT OF THE FEDERATION OF RHODESIA AND NYASALAND. MINISTRY OF HEALTH. Applications are invited for appointments as JUNIOR RESIDENT MEDICAL OFFICERS in the Government hospitals in the Federation.
The salaries applicable to these posts are :—
Southern Rhodesia : £40 per mensem plus free board, single quarters and laundry.
Northern Rhodesia : £52 1s. 8d. per mensem plus free single quarters (with essential furniture), but no board.
Application forms and further particulars may be obtained from the Public Service Attaché, Rhodesia House, 429, Strand, London, W.C.2. Closing date 10th November, 1956.

GOVERNMENT OF WESTERN NIGERIA. Medical OFFICERS required for general medical work including minor and emergency surgery in small country hospitals and general health work including the supervision of rural schools, maternity and child welfare clinics.
Appointment may be made as follows :—
(*a*) From the National Health Service. Candidates may leave the National Health Service but retain their superannuation rights up to 6 years. Salary scale for appointment on these terms is £1086–£1950 a year. A gratuity (taxable) of 20 % of the aggregate of salary is payable on completion of appointment ; or
(*b*) On short-term contract (2 tours each of 18–24 months duration). Salary in scale £1170–£2118 a year. A gratuity (taxable) at the rate of £37 10s. for each completed period of 3 months service (including leave) payable on satisfactory completion of appointment.
In addition, male officers receive supplementary pay of £120 a year.
Quarters provided at low rental. Taxes at local rates. Annual leave permissible : generous home leave granted after each tour of 18–24 months. Free return passages for Officer, wife, and children (up to 3).
Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/410/018).

GOLD COAST LOCAL CIVIL SERVICE. Ministry of HEALTH. SPECIALIST MALARIOLOGIST required to organise treatment and anti-malaria campaigns. Candidates should be qualified doctors, possess the D.P.H. and have had 4 years full-time approved experience of large scale field and laboratory malaria control works, preferably under the direction of a fully qualified Specialist Malariologist. Evidence of ability to plan and carry out the administration of large scale malaria investigations in the field would be an advantage. Appointment is to the Gold Coast Local Civil Service on contract of 2 tours of 18–24 months each in first instance with gratuity (taxable) on satisfactory completion of service. Salary scale £2400–£2700 a year. Gratuity payable at the rate of £12 10s. for each completed month of service. Temporary addition of £29 15s. a year also payable. Candidates in the National Health Service may leave the National Health Service but retain their superannuation rights (up to a maximum stay of 6 years). Salary, in this case, would be in the scale £1900–£2200 a year, and the gratuity 20 % of the aggregate of salary. Starting point in both scales according to qualifications and experience. Quarters at rental not exceeding £150 a year. Income-tax at local rates. Free passages for Officer, wife, and up to 3 children under 13. Generous home leave after each tour.
Applications to Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/13/021).

HER MAJESTY'S OVERSEA SERVICE. Government of ADEN. MEDICAL OFFICER (Special grade) (Surgeon) required for surgical duties mainly and a certain amount of general duty. Must possess F.R.C.S. or equivalent. Appointment on permanent basis with pension, or short-term contract with gratuity (taxable). Candidates in National Health Service may leave the National Health Service but retain their superannuation rights (up to 6 years) and receive a gratuity (taxable) of 20 % of aggregate of salary at end of engagement. Salary scale from £1404 to £1992 a year, starting salary depending upon age and experience. Pension for permanent appointment at rate of 1/600th of final pensionable emoluments for each completed month of service. Gratuity for contract appointment is £37 10s. for each completed 3 months of service. Outfit allowance £30–£60 payable on appointment. If required to work in Protectorate an allowance of £132–£180 a year (non-pensionable) is payable. Furnished quarters at low rental. Income-tax at local rates. Free passages provided for Officer, wife, and up to 4 children under the age of 18. Education allowance in lieu of passage for children between 8–18 undergoing full-time education outside Aden. Tour of service from 18 to 24 months. Generous home leave granted after each tour.
Application forms from the Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/2/01).

HER MAJESTY'S OVERSEA SERVICE. Tanganyika. PATHOLOGIST required for general pathological work under the direction of the Senior Pathologist with likelihood of duties with Police Force. Candidates must possess medical qualifications registrable in United Kingdom and have experience in general pathology and forensic medicine. Diploma in Bacteriology desirable but not essential. Appointment can be made on permanent basis with pension (non-contributory), or on short-term contract with gratuity (taxable) on satisfactory completion of service. A doctor in National Health Service may retain his superannuation rights (up to limit of 6 years) and receive gratuity (taxable) of 20 % of aggregate salary after engagement. Salary ranges from £1284 to £2115 a year, starting point determined by experience. 4 extra increments given to successful candidates possessing approved higher qualifications. Quarters when available at rental of £30–£78 a year according to size and type, furnitvre £12–£24 a year. Free passages in both directions for Officer and wife and up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave granted after each tour of from 30 to 36 months. Educational facilities available.
Application forms from Director of Recruitment, Colonial Office, Great Smith-street, London, S.W.1 (quoting No. BCD. 117/8/028).

LANCASHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICERS. Vacancies in Stretford/Urmston, Fylde, and in the vicinity of Wigan, Bolton, Liverpool/St. Helens, Manchester/Oldham. Possession of Diploma in Public Health desirable. Salary £1050 rising to £1475 p.a. Travelling and subsistence allowances.
Application forms and further particulars from County Medical Officer, Serial 889, East Cliff County Offices, Preston, to be returned by 3rd November, 1956.

AMENDED ADVERTISEMENT

LINCOLN. COUNTY OF LINCOLN—PARTS OF LINDSEY. ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Barton-on-Humber and Brigg Urban and the Glanford Brigg Rural Districts. Applications are invited from registered medical practitioners with experience in public health work and holding a Diploma in Public Health, Sanitary Science or State Medicine for the above whole-time mixed appointment. The salary which is in accordance with recommendations of the Medical Whitley Council Committee C as adopted by the County Council will commence at £1683 14s. 11d. p.a. and will rise by 3 annual increments of £58 14s. 11d. 1 of £61 17s. 5d., 4 of £34 7s. 7d., to a maximum of £2059 7s. 5d., and the officer appointed will be placed on the appropriate step of the scale having regard to his experience. The appointment will be subject to the Local Government Superannuation Acts, 1937 and 1953.

Forms of application and further particulars obtainable from the Clerk of the County Council, County Offices, Lincoln, to whom completed applications must be returned not later than 23rd November, 1956.

H. COPLAND, Clerk of the Lindsey County Council.

Lincoln.

NORTHUMBERLAND COUNTY COUNCIL. Applications are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER to undertake duties primarily connected with maternal and child welfare. Salary scale £1050–£50–£1200–£55–£1475. Previous experience may be taken into consideration in determining the commencing salary. Travelling and subsistence allowances when applicable will be paid in accordance with the Council's scale. The appointment is subject to superannuation and will be determinable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application and any further particulars required may be obtained from the County Medical Officer, County Hall, Newcastle upon Tyne, 1, and must be returned not later than 10th November, 1956.

NOTTINGHAMSHIRE COUNTY COUNCIL. Hucknall URBAN DISTRICT COUNCIL. Applications are invited from registered medical practitioners for the mixed whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH to the Hucknall Urban District. Applicants must have had at least 3 years professional experience since qualifying, be experienced in the duties of Medical Officer of Health, School Medical Officer and the Care of Mothers and Young Children, and possess a Diploma in Public Health.

Salaries are in accordance with the recommendations of the Medical Whitley Council for Public Health Medical Officers holding mixed appointments, namely :—

(*a*) As Assistant County Medical Officer (32/44ths) £954 10s. 11d.–£43 15s. 0d.–£1173 5s. 11d. (on scale £1200–£55–£1475, plus loading in accordance with Spens Formula).

(*b*) As Medical Officer of Health (12/44ths) £501 16s. 4d.–£15–£561 16s. 4d. (on scale £1740–£55–£1960, plus 12/44ths of £100).

Application forms and conditions of appointment are obtainable from my office and applications should reach me by 3rd November, 1956. Canvassing disqualifies.

A. R. DAVIS, Clerk of the County Council.

Shire Hall, Nottingham.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT EDUCATION COMMITTEE. Applications are invited for the post of DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Salary scale £1520–£1955 p.a. Consideration will be given to previous experience when fixing initial salary. Contributory superannuation. Candidates should have a Diploma in Public Health and considerable experience as a School Medical Officer. The appointment is terminable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Application forms are obtainable from the undersigned, P.O. Box No. 23, Town Hall, Hanley, Stoke-on-Trent, to whom they should be returned as soon as possible.

H. DIBDEN, Chief Education Officer.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

CASTLEFORD. Applications are invited for Vacancy in the Castleford Municipal Borough. List at present 1704. Present practitioner Female. Residence and surgery on rental expected to be available for successful applicant. Apply on Form E.C.16A to the undersigned, from whom further particulars may be obtained, not later than 27th October, 1956.

C. H. STABLER, Clerk of the West Riding Executive Council.

5, St. John's North, Wakefield.

ST. MARY CRAY AND ORPINGTON, KENT. Applications invited for VACANCY (urban) due to death. List at present approximately 4020. Residence and surgery will probably be available for purchase. Apply on E.C.16A before 3rd November, 1956, to— F. E.MILES, Clerk,

Kent and Canterbury Executive Council.

11, Station-road, Maidstone.

Hospital Services : Non-Medical Appointments

GOLD COAST. TEMA HOSPITAL require Deputy MATRON. Salary £1000 p.a., 18 month tours. 3 months leave on full pay. House with hard furnishings provided. Kit allowance £60.

Applications, with full personal particulars and details of training and posts held, to Box L.209, L.P.E., 55, St. Martin's-lane, W.C.2.

BIRMINGHAM. BLOOD TRANSFUSION SERVICE. JUNIOR SCIENTIFIC OFFICER. Minimum qualification B.Sc. in appropriate science subject (physiology, biology, chemistry, bacteriology, &c.). Previous experience with blood-grouping an advantage but not essential. Application for locum tenens of 9–12 months considered. Whitley Council pay, &c.

Apply Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, within 14 days of appearance of this advertisement. Further information from Director, Blood Transfusion Service, 15, Ampton-road, Birmingham, 15, by appointment.

CATERHAM, SURREY. ST. LAWRENCE'S HOSPITAL. BIOCHEMIST (graduate), basic grade, required urgently for research work in problems of metabolism in mental deficiency. Experience in and knowledge of chromatographic methods would be an advantage. Temporary appointment for a year in the first instance. Salary according to qualifications and experience (minimum £475) and conditions as laid down by Whitley Council for Health Services. A qualified technician with suitable experience would be considered ; salary in accordance with Whitley Council technicians scales.

Apply, giving names of 2 referees, to Physician-Superintendent.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited from suitably qualified candidates for post of BIOCHEMIST (Senior grade) at the Radcliffe Infirmary, Oxford. The applicant appointed will work under the Director of the Department of Clinical Biochemistry, from whom further information may be obtained. Salary, &c., in accordance with Whitley Council scale (rising to maximum of £1230 p.a.).

Applications, together with names and addresses of 2 referees, should be sent to the Administrator, Radcliffe Infirmary, Oxford, not later than 10th November, 1956.

U.S.A. LACONIA HOSPITAL, Laconia, New Hampshire, U.S.A. There is a vacancy for a TECHNICIAN with special experience in biochemistry. Laconia is a summer and winter resort in the lake district of New England.

For particulars apply to the Pathologist.

Miscellaneous

Leading Pharmaceutical Company has vacancy in the medical department for a Medical Practitioner (Male). This position entails arranging clinical trials with the Company's products, dealing with medical queries and general professional advisory work. The successful applicant will be required to do a certain amount of travel. Minimum salary £1500 p.a.—Apply with full details to : Address, No. 251, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Port of Tema, Gold Coast. Civil Engineering Company requires an experienced Medical Officer at their new Hospital ; duties are medical and administrative, involving a working knowledge of tropical medicine and hygiene ; surgical ability (except for emergency) not essential. Salary £2500 p.a., married quarters and passage both ways for family provided. Tours of service 18 months plus 3 months leave on full pay.—Applications, with full personal details and past and present appointments, to Box L198 LPE 55, St. Martin's-lane, London, W.C.2, by end of November.

Laboratory Technologist (Male or Female) required by Kenya Government Police Department on probation for pensionable employment. Salary scale (including inducement pay) £846 rising to £1566 a year. Commencing salary according to qualifications and experience. Outfit allowance £40. Separation allowance payable. Free passages. Liberal leave on full salary. Candidates must possess A.I.M.L.T. or equivalent. They should have a knowledge of biochemistry and forensic and anthropological experience. Female candidates must be single.

Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3/43685/LD.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

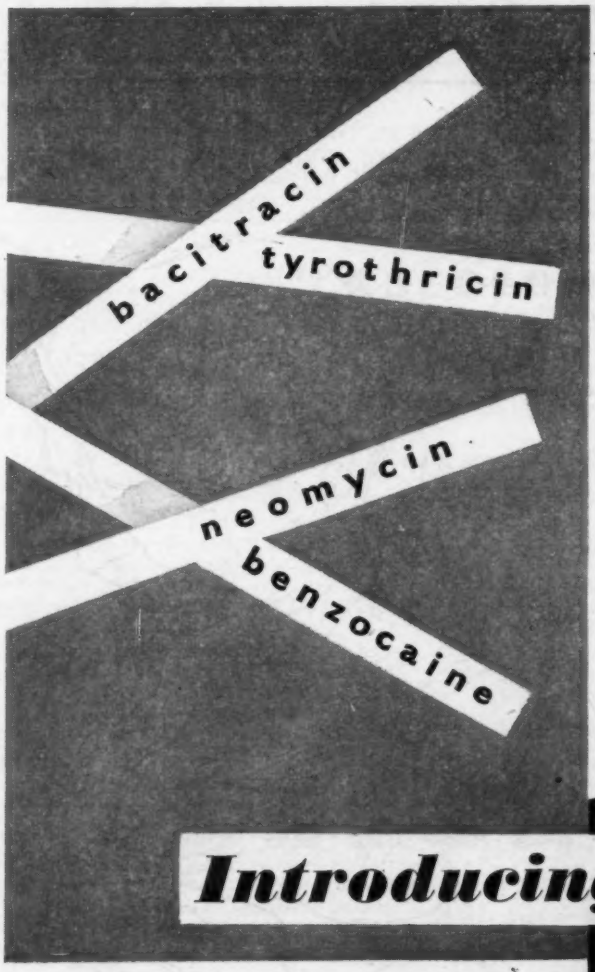
The British Journal of Medical Hypnotism. Quarterly, £1 1s. p.a.—Orders to the publishers, 4, Victoria-terrace, Hove, 3, Sussex.

Will purchase following copies to complete volumes for library, viz., *Lancet*, 1951, Sept. 1 ; 1952, Oct. 11 ; 1953, Feb. 14, 21 ; April 11 ; Nov. 28. *Annals of Surgery*, 1947, vol. 126, No. 6 ; 1948, vol., 128, Nos. 4 and 5 ; 1951, vol. 133, No. 3 ; 1955, vol. 142, No. 4.—Please communicate with Administrator, Birmingham Accident Hospital, Bath-row, Birmingham, 15.

Sunshine this winter. Madeira or Canaries 19 days by sea inc. Hotel from £79. 10 days by air inc. Hotel from £92— MONTAGUE SHAW (TRAVEL) LTD., 67, Marylebone, High-street, London, W.1. (Welbeck 8578/9).

Midwifery case with steriliser, axis-traction forceps, &c. Offers.—Address, No. 252, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, October 20, 1956.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.



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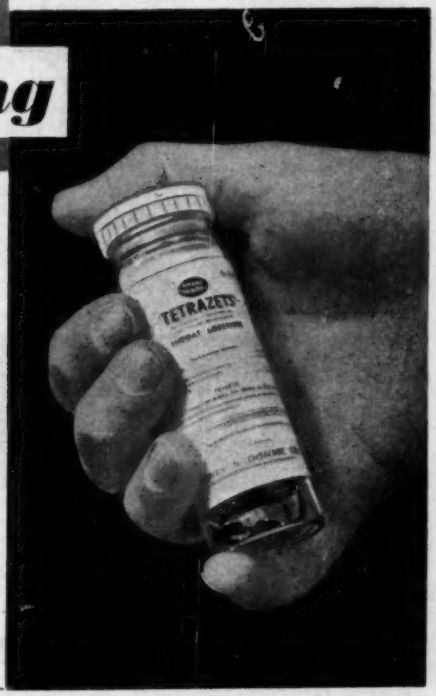

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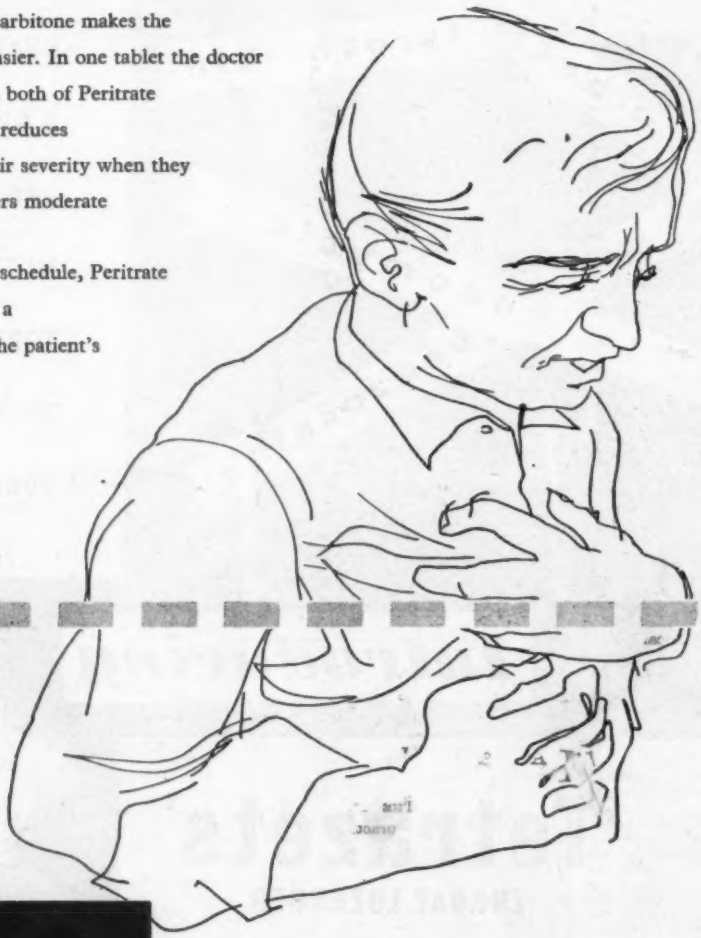

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